Construction Documents
November, 08 2019
Revised February, 11 2020

York Main Building - HVAC Replacement
York Agricultural Institute
Jamestown, Fentress County, Tennessee
SBC #168/001-01-2019

OWNER
State of Tennessee, Department of General Services for Department of Education

DRAWING INDEX

Sheet Title	Sheet Name
G0.00	COVER SHEET
M0.01	HVAC - LEGENDS AND SCHEDULES
M0.11	HVAC - DETAILS AND SPECS
M0.21	HVAC - CONTROLS
M0.22	HVAC - CONTROLS
M1.01	HVAC - DEMOLITION FLOOR PLAN - PART A
M1.02	HVAC - DEMOLITION FLOOR PLAN - PART B
M1.11	HVAC - DEMOLITION ROOF PLAN - PART A
M1.12	HVAC - DEMOLITION ROOF PLAN - PART B
M2.01	HVAC - FLOOR PLAN - PART A
M2.02	HVAC - FLOOR PLAN - PART B
M2.11	HVAC - ROOF PLAN - PART A
M2.12	HVAC - ROOF PLAN - PART B
E0.01	ELECTRICAL - LEGENDS
E1.11	POWER - DEMOLITION ROOF PLAN - PART A
E1.12	POWER - DEMOLITION ROOF PLAN - PART B
E2.01	POWER - FLOOR PLAN - PART A
E2.02	POWER - FLOOR PLAN - PART B
E2.11	POWER - ROOF PLAN - PART A
E2.12	POWER - ROOF PLAN - PART B
E3.11	ELECTRICAL - DETAILS
E3.12	ELECTRICAL - DETAILS
E4.11	ELECTRICAL - SPECIFICATIONS

PLAN REVIEW DATA

1. **APPLICABLE CODES**
   2012 International Building Code
   2012 International Fire Prevention Code
   2012 International Mechanical Code
   2012 International Plumbing Code
   2012 NFPA 101 Life Safety Code
   2011 NFPA 72 National Fire Alarm and Signaling Code
   2011 National Electrical Code
   2010 ASHRAE Standard 62

2. **OCCUPANCY TYPE:**
   Group E: Education

3. **CONSTRUCTION TYPE:**
   Group E, Type II-B Unsprinklered

4. **BUILDING AREA:**
   71,249 sf

51 Century Blvd., Suite 350
Nashville, TN 37214
P: (615) 265-8071

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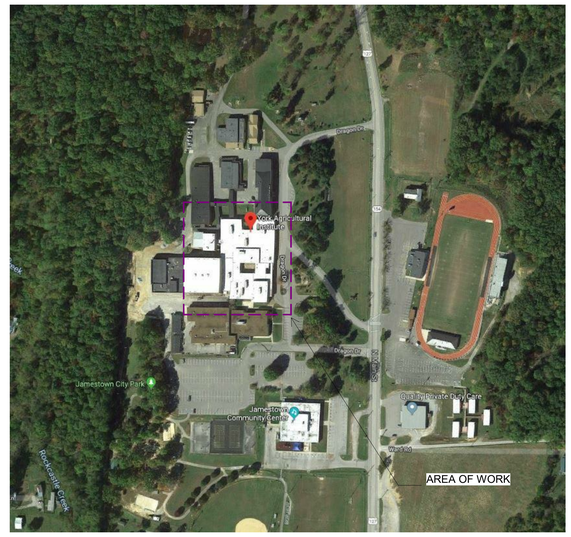
Project No. BNA19125



PROJECT LOCATION:
701 N MAIN ST.
JAMESTOWN, TN 38556

Set #____

GENERAL NOTES

1. MECHANICAL DRAWINGS ARE DIAGRAMMATIC AND SUBJECT TO REQUIREMENTS OF ARCHITECTURAL DRAWINGS AND CONDITIONS EXISTING IN THE FIELD. MECHANICAL DRAWINGS INDICATE GENERALLY THE LOCATION OF COMPONENTS AND ARE NOT INTENDED TO SHOW ALL FITTINGS OR ALL DETAILS OF THE WORK TO BE PERFORMED.
2. FOLLOW THE DRAWINGS CLOSELY, COORDINATE DIMENSIONS WITH ARCHITECTURAL DRAWINGS AND FIELD CONDITIONS. DO NOT SCALE MECHANICAL DRAWINGS FOR LOCATIONS OF SYSTEM COMPONENTS.
3. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.
4. MAKE NO CHANGES WITHOUT THE DESIGNER'S WRITTEN PERMISSION. IN CASE OF DOUBT, OBTAIN DESIGNER'S DECISION BEFORE PROCEEDING WITH WORK. FAILURE TO FOLLOW THIS INSTRUCTION SHALL MAKE THE CONTRACTOR LIABLE FOR DAMAGE TO OTHER WORK AND RESPONSIBLE FOR REMOVING AND REPAIRING DEFECTIVE OR MIS-LOCATED WORK IN PROPER MANNER.
5. DO NOT SCALE DRAWINGS TO LOCATE DIFFUSERS AND EQUIPMENT. COORDINATE WITH NEW AND EXISTING LIGHTING, ELECTRICAL CONDUIT, AND ALL EXISTING FIELD CONDITIONS.
6. PRIOR TO PREPARING SUBMITTALS, VERIFY ALL EQUIPMENT VOLTAGES WITH ELECTRICAL DRAWINGS AND ELECTRICAL CONTRACTOR AND REPORT ANY INCONSISTENCIES TO THE DESIGNER PRIOR TO ORDERING EQUIPMENT. ANY FAILURE TO DO SO WILL MAKE THE MECHANICAL CONTRACTOR RESPONSIBLE FOR ANY EQUIPMENT ORDERED WITH THE INCORRECT VOLTAGE.
7. PROTECT MECHANICAL EQUIPMENT FROM DAMAGE DURING CONSTRUCTION. WHEN INSTALLATION IS COMPLETE, CLEAN EQUIPMENT AS REQUIRED AND PROVIDE ALL NEW FILTERS.
8. INSTALL ALL EQUIPMENT TO PROVIDE NORMAL SERVICE ACCESS TO ALL COMPONENTS. INSTALL IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. IF MANUFACTURERS INSTRUCTIONS CONFLICT WITH CONTRACT DOCUMENTS, OBTAIN DESIGNER'S DECISION BEFORE PROCEEDING.
9. FURNISH ACCESS DOORS FOR VALVES, FIRE DAMPERS, DAMPERS, CONTROLS, AIR VENTS, TRAP CLEAN OUTS, AND OTHER ITEMS LOCATED ABOVE NON-LIFTOUT CEILINGS OR BEHIND PARTITIONS OR WALLS.
10. PROVIDE FIRE DAMPERS IN DUCTWORK, GRILLES, AND REGISTERS WITH FIRE RATING EQUAL TO RATING OF WALL OR CEILING. ALL FIRE DAMPERS MAY OR MAY NOT BE SHOWN ON MECHANICAL DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE ALL FIRE RATED WALL AND CEILING LOCATIONS AND RATINGS WITH ARCHITECTURAL DRAWINGS.
11. ALL WORK SHALL COMPLY WITH ALL APPLICABLE CODES AND STANDARDS (SEE SPECIFICATIONS).
12. COORDINATE EXACT LOCATION OF ALL WALL MOUNTED DEVICES (THERMOSTATS, SENSORS, ETC.) WITH ARCHITECT PRIOR TO ROUGH IN. ALL WALL MOUNTED DEVICES SHALL BE INSTALLED 48"A.F.F. TO THE CENTERLINE OF THE DEVICE (UNLESS NOTED OTHERWISE).

DUCTWORK LEGEND

(CFM) S	SUPPLY DIFFUSER
(CFM) R	RETURN GRILLE
(CFM) E	EXHAUST GRILLE
(CFM) T	TRANSFER AIR GRILLE
(CFM) SR	SIDEWALL REGISTER
Ø	ROUND DUCT SYMBOL
W X H	RECTANGULAR DUCT

FLEXIBLE CONNECTION

(T) THERMOSTAT

(H) HUMIDISTAT

RECTANGULAR SUPPLY DUCT FLOOR OR ROOF PENETRATION

RECTANGULAR RETURN AIR OR EXHAUST DUCT FLOOR OR ROOF PENETRATION

RECTANGULAR SUPPLY DUCT TURNING UP

RECTANGULAR SUPPLY AIR DUCT TURNING DOWN

RECTANGULAR RETURN AIR OR EXHAUST DUCT TURNING UP

RECTANGULAR RETURN AIR OR EXHAUST DUCT TURNING DOWN

FLAT OVAL TURNING UP.

FLAT OVAL TURNING DOWN.

ROUND DUCT TURNING UP

ROUND DUCT TURNING DOWN

MAXIMUM 5' FLEXIBLE DUCT ALL BRANCH DUCTS

RECTANGULAR 90° ELBOW WITH TURNING VANES FOR SUPPLY.
FLAT OVAL SQUARE ELBOWS ONLY WHERE REQUIRED AND SHOWN.

ROUND AND FLAT OVAL ELBOWS. DIE CAST THROUGH 5" ROUND,
5 PIECE 6" ROUND AND ABOVE

RISE OR DROP IN DUCT

RECTANGULAR BRANCH OFF OF RECTANGULAR DUCT
WITH MANUAL DAMPER

SPIN-IN WITH MANUAL DAMPER

MANUAL DAMPER

FD FIRE DAMPER (PROVIDE ACCESS DOOR)

AD AUTOMATIC DAMPER

SFD COMBINATION SMOKE/FIRE DAMPER (PROVIDE ACCESS DOOR)

AFM AIR FLOW MONITOR

PIPING LEGEND

HWS	HOT WATER SUPPLY PIPING.
HWR	HOT WATER RETURN PIPING.
D	DRAIN PIPING.
AAV OR	AAV - AUTO. AIR VENT (MARKED OR SHOWN)
	GATE VALVE.
	GLOBE VALVE.
	BALL VALVE.
	TWO-WAY AUTO CONTROL VALVE.
	THREE-WAY AUTO CONTROL VALVE.
	BUTTERFLY VALVE.
	BUTTERFLY VALVE.
	PRESSURE REDUCING VALVE.
	PIPE TURNING UP.
	PIPE TURNING DOWN.
	BRANCH OFF TOP OF MAIN.
	BRANCH OFF BOTTOM OF MAIN.
	BRANCH OFF SIDE OF MAIN.
	CALIBRATED BALANCING VALVE
	ECCENTRIC REDUCER
	STRAINER (Y)
	FLEXIBLE CONNECTION IN PIPING.
	UNION
	PETES PLUG
	SLOPE DOWN IN DIRECTION OF ARROW.
	CHECK VALVE
	ASME PRESSURE RELIEF VALVE.
DPA	DIFFERENTIAL PRESSURE ALARM

VARIABLE VOLUME ROOFTOP UNITS

MARK	SUPPLY FAN									RETURN / EXHAUST FAN							OSA CFM (MIN/MAX)	CHILLED WATER COOLING COIL									HOT WATER HEAT COIL					HOT WATER PREHEAT COIL					FILTERS	ACCESSORIES	MAX. OPERATING WEIGHT	UNIT CONFIGURATION	BASIS OF DESIGN TRANE
	CFM	INTERNAL S.P	EXTERNAL S.P	TOTAL S.P	MOTOR					CFM	"W.G. E.S.P.	MOTOR						AIR ENT.		AIR LVG.		COOLING CAPACITY		GPM	EWT	LWT	MAX F.V. (FPM)	E.A.T. (°F DB)	L.A.T. (°F DB)	MBH	GPM	MAX F.V. (FPM)	E.A.T. (°F DB)	L.A.T. (°F DB)	MBH	GPM	MAX F.V. (FPM)					
					QTY.	HP	V/Φ/Hz	MCA	MOCP			QTY.	HP	V/Φ/Hz	FLA			°F DB	°F WB	°F DB	°F WB	TOTAL	SENSIBLE																			
RTU-1	12,000	1.9	2.5	4.5	2	7.5 EACH	460/3/60	33.87	50.0	11,200	1.0	2	3 EACH	460/3/60	3.70	800/12,000	76.7	63.4	53.9	53.5	347.9 MBH	299.7 MBH	47.0	45°F	59.7°F	500						60.0	92.11	417.9	41.7	500	A	1 2 3 4 5	4,225 LBS.	X	UCCAK25C1D0ELA
RTU-2	11,000	1.7	2.5	4.3	2	7.5 EACH	460/3/60	33.87	50.0	11,000	2.5	2	3 EACH	460/3/60	3.70	750/11,000	76.7	63.4	53.6	53.2	326.8 MBH	278.7 MBH	44.0	45°F	59.8°F	500						60.0	93.56	400.4	39.9	500	A	1 2 3 4 5	4,225 LBS.	X	UCCAK25C1D0ELA
RTU-3	10,000	3.5	3.5	3.5	1	10	460/3/60	17.50	30.0	9,300	2.5	1	7.5	460/3/60	11.0	700/10,000	76.7	63.4	55.0	53.9	278.4 MBH	238.4 MBH	41.0	45°F	58.5°F	500	55.0	81.5	287.9	28.75	500	10.0	50.0	433.8	43.3	500	A	1 2 3 4 5	5,300 LBS.	Y	CSAA021
RTU-5	10,500	3.5	3.5	3.5	1	10	460/3/60	17.50	30.0	9,800	2.5	1	7.5	460/3/60	11.0	700/10,500	76.7	64.0	55.0	54.0	289.9 MBH	250.4 MBH	41.0	45°F	59.1°F	500	55.0	80.9	295.3	29.49	500	10.0	50.0	455.5	45.5	500	A	1 2 3 4 5	5,375 LBS.	Y	CSAA021
RTU-7	4,000	3.5	3.5	3.5	1	5	460/3/60	10.25	15.0	2,800	2.5	1	3	460/3/60	4.80	1,200/4,000	76.7	63.4	55.0	53.7	113.4 MBH	95.4 MBH	24	45°F	50.5°F	500	55.0	80.0	108.4	10.83	500	10.0	50.0	173.5	17.3	500	A	1 2 3 4 5	3,280 LBS.	Y	CSAA008

UNIT TYPE:

ROOFTOP, VARIABLE AIR VOLUME, DRAW THRU, DOWN DISCHARGE.

OTHER ACCEPTAPLE MANUFATURES: DAIKIN, & CARRIER

UNIT CONFIGURATION:

(X) TOP HORIZONTAL RETURN FAN; ECONOMIZER RETURN/EXHAUST; ECONOMIZER MIXING/OUTSIDE AIR; FILTER SECTION; CHILLED WATER COIL WITH ACCESS;HOTWATER COIL WITH ACCESS; VFD/CONTROLS; AXIAL SUPPLY FAN.

(Y) TOP HORIZONTAL RETURN FAN; ECONOMIZER RETURN/EXHAUST; ECONOMIZER MIXING/OUTSIDE AIR; FILTER SECTION; HOTWATER COIL WITH ACCESS; CHILLED WATER COIL WITH ACCESS;HOTWATER COIL WITH ACCESS; VFD/CONTROLS; AXIAL SUPPLY FAN.

FILTER TYPES:

(A) 4" PLEATED - MERV 8 (SIDE ACCESS).

ACCESSORIES:

(1) MARINE LIGHT WITH FACTORY MOUNTED SWITCH IN SUPPLY FAN SECTION, ACCESS SECTIONS, MIXING BOX SECTION AND DISCHARGE PLENUM.

(2) PROVIDE VFD FOR BALANCING.

(3) PROVIDE 3-WAY CHILLED WATER CONTROL VALVE.

(4) PROVIDE CURB ADAPTOR

(5) ALL PIPING CONNECTIONS TO BE INSIDE CURB

NOTES:

1. MAXIMUM COOLING COIL WATER PRESSURE DROP = 10 FT.
2. MAXIMUM COOLING COIL AIR PRESSURE DROP = 1.0" W.G.
3. MAXIMUM HEATING COIL AIR PRESSURE DROP = 0.25" W.G.
4. MAXIMUM HEATING COIL WATER PRESSURE DROP = 5 FT.
5. SUPPLY & RETURN FANS SHALL BE DIRECT DRIVE PLENUM FANS. PROVIDE 2" ISOLATION BASE.
6. CONTRACTOR TO VERIFY COIL CONNECTION AND ACCESS DOOR HAND LOCATIONS PRIOR TO ORDERING UNIT.
7. COOLING COILS SHALL BE 6 ROW MIN. AND 10 FPI MIN.
8. ESP DOES NOT INCLUDE ANY PRESSURE DROP DUE TO UNIT INTERNAL COMPONENTS. SELECT FAN WITH MID-LIFE FILTERS.
9. CASING AIR LEAKAGE SHALL NOT EXCEED LEAK CLASS 6 PER ASHRAE 111 AT 8 INCHES W.G.
10. ALL COOLING COILS SHALL HAVE STAINLESS STEEL COIL CASINGS.
11. DRAIN PANS SHALL BE STAINLESS STEEL.

EDMONDS Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

JEREMY A. WORSHAM — REGISTERED ENGINEER — AGRICULTURE — CHEMICAL — CIVIL — MECHANICAL — NO. 107352 — STATE OF TENNESSEE — 02.11.20

YORK MAIN BUILDING - HVAC REPLACEMENT

701 N Main St,
Jamestown, TN 38556

HVAC - LEGENDS AND SCHEDULES.

REVISIONS

NO	DESCRIPTION	DATE
	REVISED	02-11-20
1	REVISION 1	02-11-20

BNA19125

M0.01

DATE: 11-08-19

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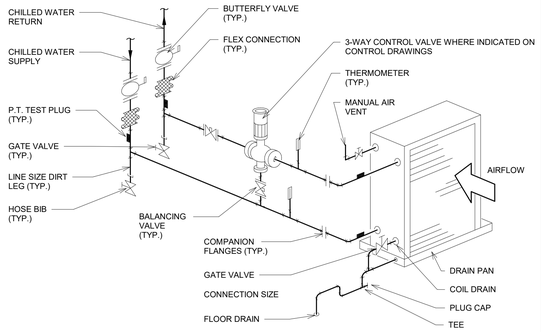
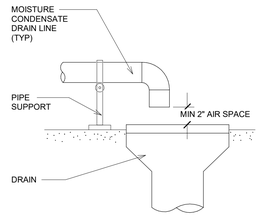
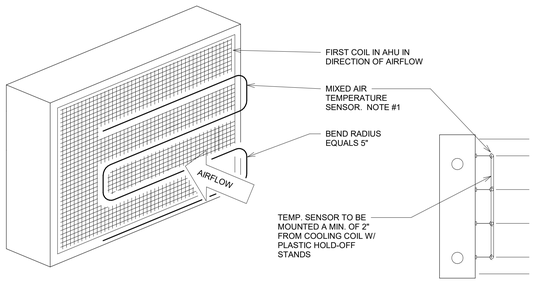


NOTES:
1. PROVIDE MANUAL AIR VENT AT HIGH POINT OF RETURN LINE.
2. WATER TO ENTER THE COIL ON THE AIR LEAVING SIDE FOR COIL TO OPERATE CORRECTLY.
3. PROVIDE STAINLESS STEEL DRAIN PAN SLOPED FOR POSITIVE DRAINAGE.

PIPING AT COOLING COIL (3-WAY VALVE)
NOT TO SCALE

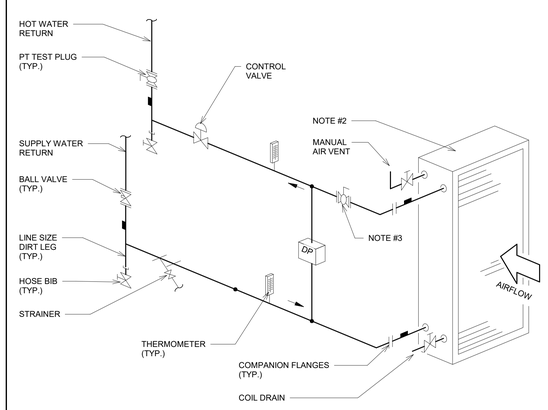


TERMINATION DETAIL OF MOISTURE CONDENSATE LINE
NOT TO SCALE



NOTES
1. PROVIDE MIN. 1 LINEAR FOOT OF TEMPERATURE SENSOR PER SQUARE FOOT OF COIL.
2. PROVIDE ON THE ENTERING SIDE OF COIL FOR MIXED AIR AND FREEZESTAT READINGS.
3. PROVIDE ON THE LEAVING SIDE OF COIL FOR PREHEAT COIL TEMP READING.

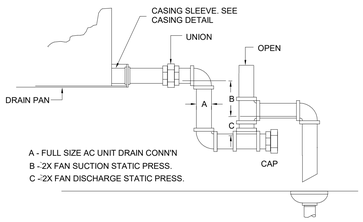
TEMPERATURE SENSOR MOUNTING DETAIL
NOT TO SCALE



NOTES
1. PROVIDE AUTOMATIC AIR VENT AT HIGH POINT OF RETURN LINE.
2. WATER TO ENTER COIL ON AIR LEAVING SIDE FOR COIL TO OPERATE CORRECTLY.
3. BALANCING AND SHUT-OFF VALVE, PROVIDE 3-PIPE DIAMETERS STRAIGHT LENGTH OF PIPE BEFORE AND AFTER VALVES.

PIPING AT PREHEAT & REHEAT HOT WATER COIL
NOT TO SCALE

MINIMUM CONDENSATE PIPE SIZE	
AC TONS	MIN. DRAIN SIZE
0 TO 20	1"
21 TO 40	1-1/4"
41 TO 60	1-1/2"
61 TO 100	2"
101 TO 250	3"
251 & LARGER	4"



AC UNIT DRAIN TRAP DETAIL
NOT TO SCALE

MECHANICAL SPECIFICATIONS:

GENERAL CONDITIONS:

1) CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A COMPLETE OPERATIONAL HEATING, VENTILATING, AND COOLING SYSTEM WHICH MEETS ALL GOVERNING CODES AND IN ACCORDANCE WITH THE DESIGN DRAWINGS.

2) ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD MECHANICAL CODE, NFPA REQUIREMENTS, AND ALL LOCAL CODES.

3) THE CONTRACTOR SHALL PAY FOR ALL FEES, PERMITS, AND CHARGES AS REQUIRED TO ACHIEVE THE INSTALLATION.

4) MECHANICAL WORK SHALL BE GUARANTEED FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE.

5) DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS. DRAWINGS SHALL NOT BE SCALED.

6) CONTRACTOR SHALL SUBMIT FOR REVIEW PDF COPY OF ALL EQUIPMENT, DEVICES, AND MATERIALS USED FOR THE JOB. ALLOW A MINIMUM OF 14 DAYS REVIEW TIME FOR SCHEDULING PURPOSES. WHEN REQUESTED, SUBMIT ANY PRODUCT SAMPLES TO DESIGNER FOR REVIEW.

7) PROVIDE ACCESS DOORS IN DUCTS, WALLS, AND CEILINGS AS REQUIRED TO ACCESS DAMPERS, VALVES, AND OTHER ENCLOSED ITEMS. COORDINATE LOCATION OF ALL DOORS WITH GENERAL CONTRACTOR.

AIR DEVICES:

8) FIRE DAMPERS TO BE TYPE "B" UNLESS OTHERWISE NOTED. INSTALLATION TO BE IN STRICT ACCORDANCE WITH MANUFACTURER'S U.L. LISTED INSTALLATION INSTRUCTIONS AND SMACNA FIRE DAMPER GUIDE.

9) COORDINATE LOCATION AND PROVIDE DUCT ACCESS DOORS FOR ACCESS TO ALL FIRE DAMPERS. DUCT ACCESS DOORS MAY BE OMITTED WHERE TYPE "A" FIRE DAMPERS ARE ACCESSIBLE THROUGH SIDEWALL REGISTER FACE. ENSURE DUCT ACCESS DOORS AND DAMPERS ARE ACCESSIBLE THROUGH CEILINGS AND WALLS. LOCATE DUCT ACCESS DOORS ABOVE SPACES WITH LAY-IN CEILINGS OR EXPOSED CEILINGS WHERE POSSIBLE. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR CEILING TYPES.

DUCTWORK:

10) ALL AIR DISTRIBUTION SYSTEM(S) SHALL BE TESTED AND BALANCED IN ACCORDANCE WITH A.A.B.C. REQUIREMENTS TO WITHIN FIVE PERCENT (5%) OF THE VALUES SHOWN ON THE DRAWINGS. THREE COPIES OF A CERTIFIED AIR BALANCE REPORT SHALL BE GIVEN TO THE DESIGNER PRIOR TO PROJECT CLOSEOUT.

11) ALL MEDIUM-PRESSURE DUCTWORK SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH THE 1995 SMACNA DUCT CONSTRUCTION MANUAL FOR 4" W.G. STATIC PRESSURE AND CLASS "A" SEALS. DUCT SEALANT TO BE MINERAL IMPREGNATED WOVEN FILTER TAPE AND PLASTIC TYPE ACTIVATOR/ADHESIVE AS MANUFACTURED BY HARDCAST.

12) ALL LOW-PRESSURE DUCTWORK SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH THE 1995 SMACNA HVAC DUCT CONSTRUCTION MANUAL FOR 2" W.G. STATIC PRESSURE AND CLASS "C" SEALS. DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED SHEET METAL. SEAL ALL TRANSVERSE JOINTS WITH DUCT SEALANT, HARDCAST #P301.

13) SUPPORT ALL DUCTWORK WITH SUITABLE SHEARED STRIPS OF GALVANIZED METAL OF 1" X 1/8" STEEL BAND IRON HANGERS ON EACH SIDE OF DUCT. SPACE HANGERS MAXIMUM 8 FEET ALONG DUCT AND SECURE HANGERS TO STRUCTURE AS REQUIRED.

14) ALL DUCT DIMENSIONS SHOWN ON DRAWINGS ARE INSIDE CLEAR. ALLOWANCE MUST BE MADE IN SHEET METAL SIZE WHERE DUCT LINER IS SPECIFIED.

15) ALL SUPPLY AND OUTSIDE AIR DUCT TO BE EXTERNALLY INSULATED WITH 1-1/2" THICK, 1 LB. DENSITY, FLEXIBLE, FACTORY-REINFORCED GLASS FIBER BLANKET WITH FOIL-FACED VAPOR BARRIER JACKET. SEAL ALL SEAMS, RIPS, TEARS, STAPLES, ETC., IN VAPOR BARRIER WITH VAPOR BARRIER MASTIC EMBEDDED WITH FIBERGLASS MESH CLOTH. PRESSURE SENSITIVE TAPE NOT ALLOWED.

16) ALL RETURN DUCT TO BE INTERNALLY INSULATED WITH 1" THICK, 1-1/2 LB. DENSITY, NEOPRENE-COATED FIBERGLASS MATT-FACED FLEXIBLE DUCT LINER. ALLOWANCE MUST BE MADE IN DUCT SIZES TO ACCOMMODATE LINER.

17) WHERE BRANCH TAPS OCCUR, PROVIDE INDIVIDUAL SPIN-IN FITTINGS WITH MANUAL-VOLUME DAMPERS FOR BALANCING. DO NOT USE TYPE WITH AIR SCOOP/EXTRACTOR. ADDITIONALLY, PROVIDE OPPOSED-BLADE VOLUME DAMPERS AT EACH AIR TERMINAL DEVICE.

18) PROVIDE CANVAS, FLAME RETARDANT DUCT CONNECTORS AT ALL CONNECTIONS OF FANS TO DUCTWORK.

PIPING:

19) ALL MOISTURE CONDENSATE DRAIN (MCD) LINES SHALL BE INSULATED WITH 1/2" ARMAFLEX AP TYPE INSULATION RATED FOR PLENUM USE WHEN USED INDOORS. LINES SHALL BE "DWV" COPPER WITH 50-50 SOLDER JOINTS OR SCHEDULE 40 GALVANIZED STEEL INDOORS AND SCHEDULE 40 PVC OUTDOORS. ALL FITTINGS SHALL BE DRAINAGE PATTERN TYPE. SLOPE PIPING MINIMUM 1/8" PER FOOT TOWARD DRAIN. PROVIDE LINE SIZE CLEANOUTS AT P-TRAP AND SPACED MAXIMUM 50'-0" ON CENTER. SEE PLUMBING DRAWINGS FOR EXACT LOCATION OF FLOOR DRAINS, HUB DRAINS, AND SINK P-TRAP CONNECTIONS FOR MCD DISCHARGE.

20) HEATING HOT WATER AND CHILLED WATER PIPING SHALL BE TYPE "L" HARD DRAWN COPPER TUBING, ASTM B-88. PROVIDE SWEAT FITTINGS, ASTM B-62, WROUGHT COPPER WITH SWEEP PATTERN. PROVIDE BRASS ISOLATION ADAPTERS AT COPPER PIPING CONNECTIONS TO STEEL PIPING.

21) INSULATE ALL CHILLED AND HEATING HOT WATER SUPPLY PIPING WITH 1" THICK JACKETED GLASS FIBER INSULATION WITH ALL-SERVICE JACKET EQUIVALENT TO MANVILLE "MICRO-LOK 650," SEAL ALL STAPLES, RIPS, TEARS, JOINTS, ETC., WITH VAPOR BARRIER MASTIC.

22) INSULATE ALL CHILLED AND HEATING HOT WATER PIPING AND MOISTURE CONDENSATE DRAIN (MCD) LINES WITH 3/4" THICK FLEXIBLE ELASTOMERIC INSULATION EQUAL TO ARMAFLEX AP.

23) PATCH ALL RATED FLOOR AND RATED WALL PENETRATIONS WITH U.L. APPROVED ASSEMBLIES IN ACCORDANCE WITH SBC CHAPTER 10 REQUIREMENTS.

COORDINATION REQUIREMENTS:

24) THE CONTRACTOR IS REQUIRED TO VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS PRIOR TO SUBMITTING A BID.

25) THE DRAWINGS MAY NOT SHOW ALL EXISTING ITEMS OR CONDITIONS. CONTRACTOR SHALL NOT RECEIVE EXTRA PAYMENT FOR REQUIREMENTS WHICH CAN BE INFERRED THROUGH OBSERVATION OF EXISTING CONDITIONS AT THE SITE. IN THE EVENT CONCEALED CONDITIONS ARE ENCOUNTERED WHICH MAY VARY SIGNIFICANTLY FROM THOSE INDICATED ON THE DRAWINGS, NOTIFY THE DESIGNER BEFORE PROCEEDING WITH WORK.

26) CONTRACTOR SHALL FIELD VERIFY BY MEASUREMENT THE EXACT LOCATION OF EQUIPMENT, DUCTWORK, PIPING, STRUCTURE, AND OTHER CONDITIONS WHICH WILL AFFECT INSTALLATION. CONTRACTOR SHALL LOCATE EQUIPMENT AND ROUTE DUCTWORK AND PIPING TO AVOID CONFLICTS AND INTERFERENCES WITH EXISTING FIELD CONDITIONS.

27) PRIOR TO ANY INSTALLATION, CLOSELY COORDINATE ALL MECHANICAL WORK WITH PLUMBING, FIRE PROTECTION, ELECTRICAL, ARCHITECTURAL, AND STRUCTURAL WORK. CONTRACTOR TO ENSURE ALL EQUIPMENT AND SERVICES WILL FIT IN AVAILABLE SPACES ALLOWING CEILING HEIGHTS INDICATED ON ARCHITECTURAL PLANS. INSTALL EQUIPMENT SO AS TO PROVIDE CLEARANCES SHOWN ON DRAWINGS AND AS RECOMMENDED BY MANUFACTURER FOR AIRFLOW, SERVICE, MAINTENANCE, AND FILTER REMOVAL AS APPLICABLE.

28) ALL CUTTING AND PATCHING SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. ALL PATCHING SHALL RESTORE EACH DAMAGED SURFACE TO ITS ORIGINAL FINISH.

29) ALL EXPOSED DUCTWORK, PIPING, AND EQUIPMENT IN FINISHED SPACES TO BE INSTALLED AS HIGH AS POSSIBLE ABOVE FINISHED FLOOR.

EDMONDS Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

YORK MAIN BUILDING - HVAC REPLACEMENT
701 N Main St,
Jamestown, TN 38556

HVAC - DETAILS AND SPECS

REVISIONS		
NO	DESCRIPTION	DATE
	REVISED	02-11-20

BNA19125

M0.11

DATE: 11-08-19

2/11/2020 5:05:24 PM

Variable Air Volume - RTU-3,5,7

Run Conditions - Requested:
The unit shall run whenever:
- Any zone is occupied.
- OR a definable number of unoccupied zones need heating or cooling.

Freeze Protection:
The unit shall shut down and generate an alarm upon receiving a freezestat status.

High Static Shutdown:
The unit shall shut down and generate an alarm upon receiving an high static shutdown signal.

Supply Air Smoke Detection:
The unit shall shut down and generate an alarm upon receiving a supply air smoke detector status.

Supply Fan:
The supply fan shall run anytime the unit is commanded to run, unless shutdown on safeties. To prevent short cycling, the supply fan shall have a user definable (adj.) minimum runtime.

Alarms shall be provided as follows:
- Supply Fan Failure: Commanded on, but the status is off.
- Supply Fan in Hand: Commanded off, but the status is on.
- Supply Fan Runtime Exceeded: Status runtime exceeds a user definable limit (adj.).

Supply Air Duct Static Pressure Control:
The controller shall measure duct static pressure and shall modulate the supply fan VFD speed to maintain a duct static pressure setpoint of 1.5in H2O (adj.). The supply fan VFD speed shall not drop below 30% (adj.).

Alarms shall be provided as follows:
- High Supply Air Static Pressure: If the supply air static pressure is 25% (adj.) greater than setpoint.
- Low Supply Air Static Pressure: If the supply air static pressure is 25% (adj.) less than setpoint.
- Supply Fan VFD Fault.

Return Fan:
The return fan shall run whenever the supply fan runs.

Alarms shall be provided as follows:
- Return Fan Failure: Commanded on, but the status is off.
- Return Fan in Hand: Commanded off, but the status is on.
- Return Fan Runtime Exceeded: Status runtime exceeds a user definable limit (adj.).
- Return Fan VFD Fault.

Return Airflow:
The return fan VFD shall modulate in unison with the supply fan VFD. Return airflow setpoint shall be 100% (adj.) of the supply airflow minus 1000ft3/min (adj.). The return fan VFD speed shall not drop below 20% (adj.).

Alarms shall be provided as follows:
- High Return Airflow: If the return airflow is an adjustable percentage greater than setpoint.
- Low Return Airflow: If the return airflow is an adjustable percentage less than setpoint.

Preheating Coil Valve:
The controller shall measure the mixed air temperature and modulate the preheating coil valve to maintain its setpoint 5°F (adj.) less than the supply air temperature setpoint.

The preheating shall be enabled whenever:
- Outside air temperature is less than 60°F (adj.).
- AND the economizer (if present) is disabled.
- AND the supply fan status is on.

The preheating coil valve shall open for freeze protection whenever:
- Mixed air temperature drops from 40°F to 35°F (adj.).
- OR the freezestat (if present) is on.

Supply Air Temperature Setpoint - Optimized:
The controller shall monitor the supply air temperature and shall maintain a supply air temperature setpoint reset based on zone cooling and heating requirements

The supply air temperature setpoint shall be reset for cooling based on zone cooling requirements as follows:
- The initial supply air temperature setpoint shall be 55°F (adj.).
- As cooling demand increases, the setpoint shall incrementally reset down to a minimum of 53°F (adj.).
- As cooling demand decreases, the setpoint shall incrementally reset up to a maximum of 72°F (adj.) .

If more zones need heating than cooling, then the supply air temperature setpoint shall be reset for heating as follows:
- The initial supply air temperature setpoint shall be 82°F (adj.).
- As heating demand increases, the setpoint shall incrementally reset up to a maximum of 85°F (adj.).
- As heating demand decreases, the setpoint shall incrementally reset down to a minimum of 72°F (adj.).

Cooling Coil Valve:
The controller shall measure the supply air temperature and modulate the cooling coil valve to maintain its cooling setpoint.

The cooling shall be enabled whenever:
- Outside air temperature is greater than 60°F (adj.).
- AND the economizer (if present) is disabled or fully open.
- AND the supply fan status is on.
- AND the heating (if present) is not active.

The cooling coil valve shall open to 50% (adj.) whenever the freezestat (if present) is on.

Alarms shall be provided as follows:
- High Supply Air Temp: If the supply air temperature is 5°F (adj.) greater than setpoint.

Heating Coil Valve:
The controller shall measure the supply air temperature and modulate the heating coil valve to maintain its heating setpoint.

The heating shall be enabled whenever:
- Outside air temperature is less than 65°F (adj.).
- AND the supply fan status is on.
- AND the cooling (if present) is not active.

The heating coil valve shall open whenever:
- Supply air temperature drops from 40°F to 35°F (adj.).
- OR the freezestat (if present) is on.

Alarms shall be provided as follows:
- Low Supply Air Temp: If the supply air temperature is 5°F (adj.) less than setpoint.

Economizer:
The controller shall measure the mixed air temperature and modulate the economizer dampers in sequence to maintain a setpoint 2° F (adj.) less than the supply air temperature setpoint. The outside air dampers shall maintain a minimum adjustable position of 20% (adj.) open whenever occupied.

The economizer shall be enabled whenever:
- Outside air temperature is less than 65°F (adj.).
- AND the outside air temperature is less than the return air temperature.
- AND the supply fan status is on.

The economizer shall close whenever:
- Mixed air temperature drops from 40°F to 35°F (adj.).
- OR the freezestat (if present) is on.
- OR on loss of supply fan status.

The outside and exhaust air dampers shall close and the return air damper shall open when the unit is off. If Optimal Start Up is available the mixed air damper shall operate as described in the occupied mode except that the outside air damper shall modulate to fully closed.

Minimum Outside Air Ventilation - Fixed Percentage:
The outside air dampers shall maintain a minimum adjustable position during building occupied hours and be closed during unoccupied hours.

Prefilter Differential Pressure Monitor:
The controller shall monitor the differential pressure across the prefilter.

Alarms shall be provided as follows:
- Prefilter Change Required: Prefilter differential pressure exceeds a user definable limit (adj.).

Mixed Air Temperature:
The controller shall monitor the mixed air temperature and use as required for economizer control (if present) or preheating control (if present).

Alarms shall be provided as follows:
- High Mixed Air Temp: If the mixed air temperature is greater than 90°F (adj.).
- Low Mixed Air Temp: If the mixed air temperature is less than 45°F (adj.).

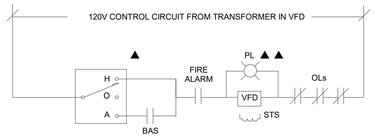
Return Air Temperature:
The controller shall monitor the return air temperature and use as required for setpoint control or economizer control (if present).

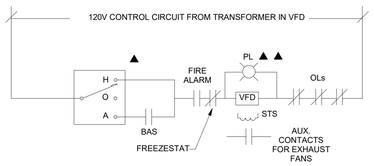
Alarms shall be provided as follows:
- High Return Air Temp: If the return air temperature is greater than 90°F (adj.).
- Low Return Air Temp: If the return air temperature is less than 45°F (adj.).

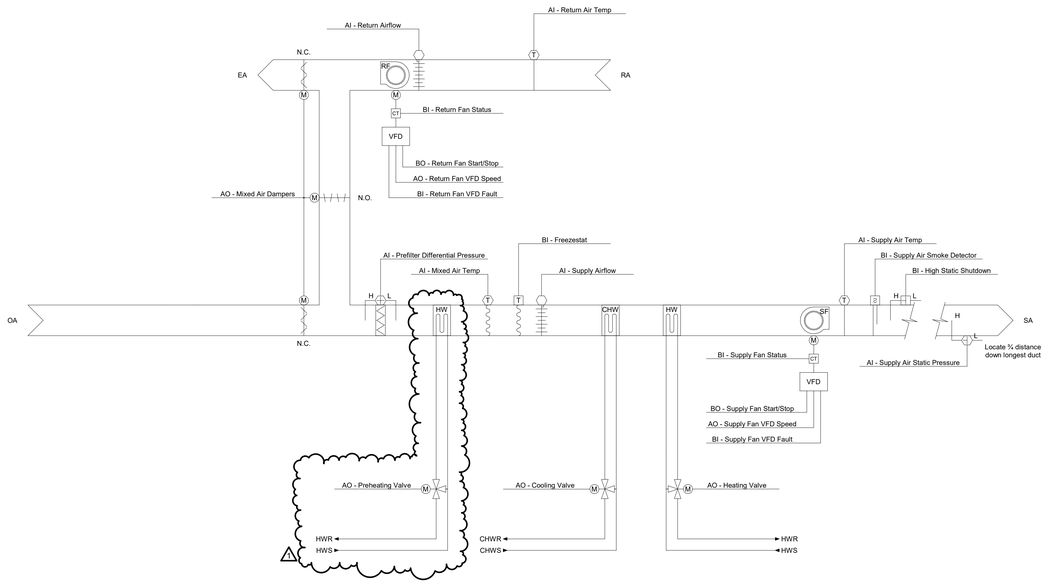
Supply Air Temperature:
The controller shall monitor the supply air temperature.

Alarms shall be provided as follows:
- High Supply Air Temp: If the supply air temperature is greater than 120°F (adj.).
- Low Supply Air Temp: If the supply air temperature is less than 45°F (adj.).

	Hardware Points				Software Points					
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Show On Graphic
Mixed Air Temp	x								x		x
Prefilter Differential Pressure	x								x		
Return Air Temp	x								x		x
Return Airflow	x								x		x
Supply Air Static Pressure	x								x	x	x
Supply Air Temp	x								x		x
Supply Airflow	x								x		x
Cooling Valve		x							x		x
Heating Valve		x							x		x
Mixed Air Dampers		x							x		x
Preheating Valve		x							x		x
Return Fan VFD Speed		x							x		x
Supply Fan VFD Speed		x							x		x
Freezestat			x						x	x	x
High Static Shutdown			x						x	x	x
Return Fan Status			x						x		x
Return Fan VFD Fault			x							x	
Supply Air Smoke Detector			x						x	x	x
Supply Fan Status			x						x		x
Supply Fan VFD Fault			x							x	x
Return Fan Start/Stop				x					x		x
Supply Fan Start/Stop				x					x		x
Economizer Mixed Air Temp Setpoint					x				x		x
Preheating Mixed Air Temp Setpoint					x				x		x
Return Airflow Setpoint					x				x		x
Supply Air Static Pressure Setpoint					x				x		x
Supply Air Temp Setpoint					x				x		x
High Mixed Air Temp										x	
High Return Air Temp										x	
High Return Airflow										x	
High Supply Air Static Pressure										x	
High Supply Air Temp										x	
High Supply Air Temp										x	
Low Mixed Air Temp										x	
Low Return Air Temp										x	
Low Return Airflow										x	
Low Supply Air Static Pressure										x	
Low Supply Air Temp										x	
Low Supply Air Temp										x	
Prefilter Change Required										x	x
Return Fan Failure										x	
Return Fan in Hand										x	
Return Fan Runtime Exceeded										x	
Supply Fan Failure										x	
Supply Fan in Hand										x	
Supply Fan Runtime Exceeded										x	







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EDMONDS Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

JERRY A. WORSHAM — REGISTERED ENGINEER — AGRICULTURE — 02.11.20 — NO. 107352 — STATE OF TENNESSEE

YORK MAIN BUILDING - HVAC REPLACEMENT

701 N Main St,
Jamestown, TN 38556

HVAC - CONTROLS

REVISIONS

NO	DESCRIPTION	DATE
	REVISED	02-11-20
1	REVISION 1	02-11-20

BNA19125

M0.21

DATE: 11-08-19

Variable Air Volume - RTU-1,2

Run Conditions - Requested:
The unit shall run whenever:
- Any zone is occupied.
- OR a definable number of unoccupied zones need heating or cooling.

Freeze Protection:
The unit shall shut down and generate an alarm upon receiving a freezestat status.

High Static Shutdown:
The unit shall shut down and generate an alarm upon receiving an high static shutdown signal.

Supply Air Smoke Detection:
The unit shall shut down and generate an alarm upon receiving a supply air smoke detector status.

Supply Fan:
The supply fan shall run anytime the unit is commanded to run, unless shutdown on safeties. To prevent short cycling, the supply fan shall have a user definable (adj.) minimum runtime.

Alarms shall be provided as follows:
- Supply Fan Failure: Commanded on, but the status is off.
- Supply Fan in Hand: Commanded off, but the status is on.
- Supply Fan Runtime Exceeded: Status runtime exceeds a user definable limit (adj.).

Supply Air Duct Static Pressure Control:
The controller shall measure duct static pressure and shall modulate the supply fan VFD speed to maintain a duct static pressure setpoint of 1.5in H2O (adj.). The supply fan VFD speed shall not drop below 30% (adj.).

Alarms shall be provided as follows:
- High Supply Air Static Pressure: If the supply air static pressure is 25% (adj.) greater than setpoint.
- Low Supply Air Static Pressure: If the supply air static pressure is 25% (adj.) less than setpoint.
- Supply Fan VFD Fault.

Return Fan:
The return fan shall run whenever the supply fan runs.

Alarms shall be provided as follows:
- Return Fan Failure: Commanded on, but the status is off.
- Return Fan in Hand: Commanded off, but the status is on.
- Return Fan Runtime Exceeded: Status runtime exceeds a user definable limit (adj.).
- Return Fan VFD Fault.

Return Airflow:
The return fan VFD shall modulate in unison with the supply fan VFD. Return airflow setpoint shall be 100% (adj.) of the supply airflow minus 1000ft3/min (adj.). The return fan VFD speed shall not drop below 20% (adj.).

Alarms shall be provided as follows:
- High Return Airflow: If the return airflow is an adjustable percentage greater than setpoint.
- Low Return Airflow: If the return airflow is an adjustable percentage less than setpoint.

Preheating Coil Valve:
The controller shall measure the mixed air temperature and modulate the preheating coil valve to maintain its setpoint 5°F (adj.) less than the supply air temperature setpoint.

The preheating shall be enabled whenever:
- Outside air temperature is less than 60°F (adj.).
- AND the economizer (if present) is disabled.
- AND the supply fan status is on.

The preheating coil valve shall open for freeze protection whenever:
- Mixed air temperature drops from 40°F to 35°F (adj.).
- OR the freezestat (if present) is on.

Supply Air Temperature Setpoint - Optimized:
The controller shall monitor the supply air temperature and shall maintain a supply air temperature setpoint reset based on zone cooling and heating requirements

The supply air temperature setpoint shall be reset for cooling based on zone cooling requirements as follows:
- The initial supply air temperature setpoint shall be 55°F (adj.).
- As cooling demand increases, the setpoint shall incrementally reset down to a minimum of 53°F (adj.).
- As cooling demand decreases, the setpoint shall incrementally reset up to a maximum of 72°F (adj.) .

If more zones need heating than cooling, then the supply air temperature setpoint shall be reset for heating as follows:
- The initial supply air temperature setpoint shall be 82°F (adj.).
- As heating demand increases, the setpoint shall incrementally reset up to a maximum of 85°F (adj.).
- As heating demand decreases, the setpoint shall incrementally reset down to a minimum of 72°F (adj.).

Cooling Coil Valve:
The controller shall measure the supply air temperature and modulate the cooling coil valve to maintain its cooling setpoint.

The cooling shall be enabled whenever:
- Outside air temperature is greater than 60°F (adj.).
- AND the economizer (if present) is disabled or fully open.
- AND the supply fan status is on.
- AND the heating (if present) is not active.

The cooling coil valve shall open to 50% (adj.) whenever the freezestat (if present) is on.

Alarms shall be provided as follows:
- High Supply Air Temp: If the supply air temperature is 5°F (adj.) greater than setpoint.

Economizer:
The controller shall measure the mixed air temperature and modulate the economizer dampers in sequence to maintain a setpoint 2° F (adj.) less than the supply air temperature setpoint. The outside air dampers shall maintain a minimum adjustable position of 20% (adj.) open whenever occupied.

The economizer shall be enabled whenever:
- Outside air temperature is less than 65°F (adj.).
- AND the outside air temperature is less than the return air temperature.
- AND the supply fan status is on.

The economizer shall close whenever:
- Mixed air temperature drops from 40°F to 35°F (adj.).
- OR the freezestat (if present) is on.
- OR on loss of supply fan status.

The outside and exhaust air dampers shall close and the return air damper shall open when the unit is off. If Optimal Start Up is available the mixed air damper shall operate as described in the occupied mode except that the outside air damper shall modulate to fully closed.

Minimum Outside Air Ventilation - Fixed Percentage:
The outside air dampers shall maintain a minimum adjustable position during building occupied hours and be closed during unoccupied hours.

Prefilter Differential Pressure Monitor:
The controller shall monitor the differential pressure across the prefilter.

Alarms shall be provided as follows:
- Prefilter Change Required: Prefilter differential pressure exceeds a user definable limit (adj.).

Mixed Air Temperature:
The controller shall monitor the mixed air temperature and use as required for economizer control (if present) or preheating control (if present).

Alarms shall be provided as follows:
- High Mixed Air Temp: If the mixed air temperature is greater than 90°F (adj.).
- Low Mixed Air Temp: If the mixed air temperature is less than 45°F (adj.).

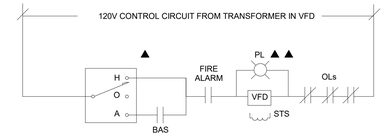
Return Air Temperature:
The controller shall monitor the return air temperature and use as required for setpoint control or economizer control (if present).

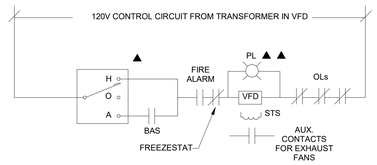
Alarms shall be provided as follows:
- High Return Air Temp: If the return air temperature is greater than 90°F (adj.).
- Low Return Air Temp: If the return air temperature is less than 45°F (adj.).

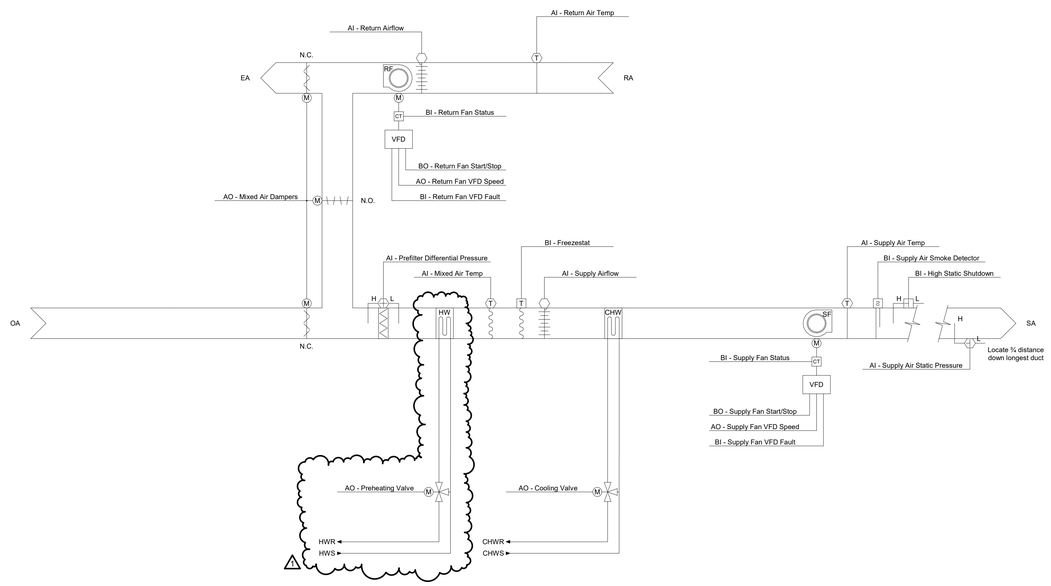
Supply Air Temperature:
The controller shall monitor the supply air temperature.

Alarms shall be provided as follows:
- High Supply Air Temp: If the supply air temperature is greater than 120°F (adj.).
- Low Supply Air Temp: If the supply air temperature is less than 45°F (adj.).

	Hardware Points				Software Points						
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Show On Graphic
Mixed Air Temp	x								x		x
Prefilter Differential Pressure	x								x		
Return Air Temp	x								x		x
Return Airflow	x								x		x
Supply Air Static Pressure	x								x	x	x
Supply Air Temp	x								x		x
Supply Airflow	x								x		x
Cooling Valve		x							x		x
Mixed Air Dampers		x							x		x
Preheating Valve		x							x		x
Return Fan VFD Speed		x							x		x
Supply Fan VFD Speed		x							x		x
Freezestat			x						x	x	x
High Static Shutdown			x						x	x	x
Return Fan Status			x						x		x
Return Fan VFD Fault			x							x	
Supply Air Smoke Detector			x						x	x	x
Supply Fan Status			x						x		x
Supply Fan VFD Fault			x							x	x
Return Fan Start/Stop				x					x		x
Supply Fan Start/Stop				x					x		x
Economizer Mixed Air Temp Setpoint					x				x		x
Preheating Mixed Air Temp Setpoint					x				x		x
Return Airflow Setpoint					x				x		x
Supply Air Static Pressure Setpoint					x				x		x
Supply Air Temp Setpoint					x				x		x
High Mixed Air Temp										x	
High Return Air Temp										x	
High Return Airflow										x	
High Supply Air Static Pressure										x	
High Supply Air Temp										x	
High Supply Air Temp										x	
Low Mixed Air Temp										x	
Low Return Air Temp										x	
Low Return Airflow										x	
Low Supply Air Static Pressure										x	
Low Supply Air Temp										x	
Low Supply Air Temp										x	
Prefilter Change Required										x	x
Return Fan Failure										x	
Return Fan in Hand										x	
Return Fan Runtime Exceeded										x	
Supply Fan Failure										x	
Supply Fan in Hand										x	
Supply Fan Runtime Exceeded										x	







EDMONDS Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

JERRY A. WORSHAM
REGISTERED ENGINEER
AGRICULTURE
CIVIL
No. 107352
STATE OF TENNESSEE
02.11.20

YORK MAIN BUILDING - HVAC REPLACEMENT
701 N Main St,
Jamestown, TN 38556

HVAC - CONTROLS

REVISIONS

NO	DESCRIPTION	DATE
	REVISED	02-11-20
1	REVISION 1	02-11-20

BNA19125

M0.22

DATE: 11-08-19

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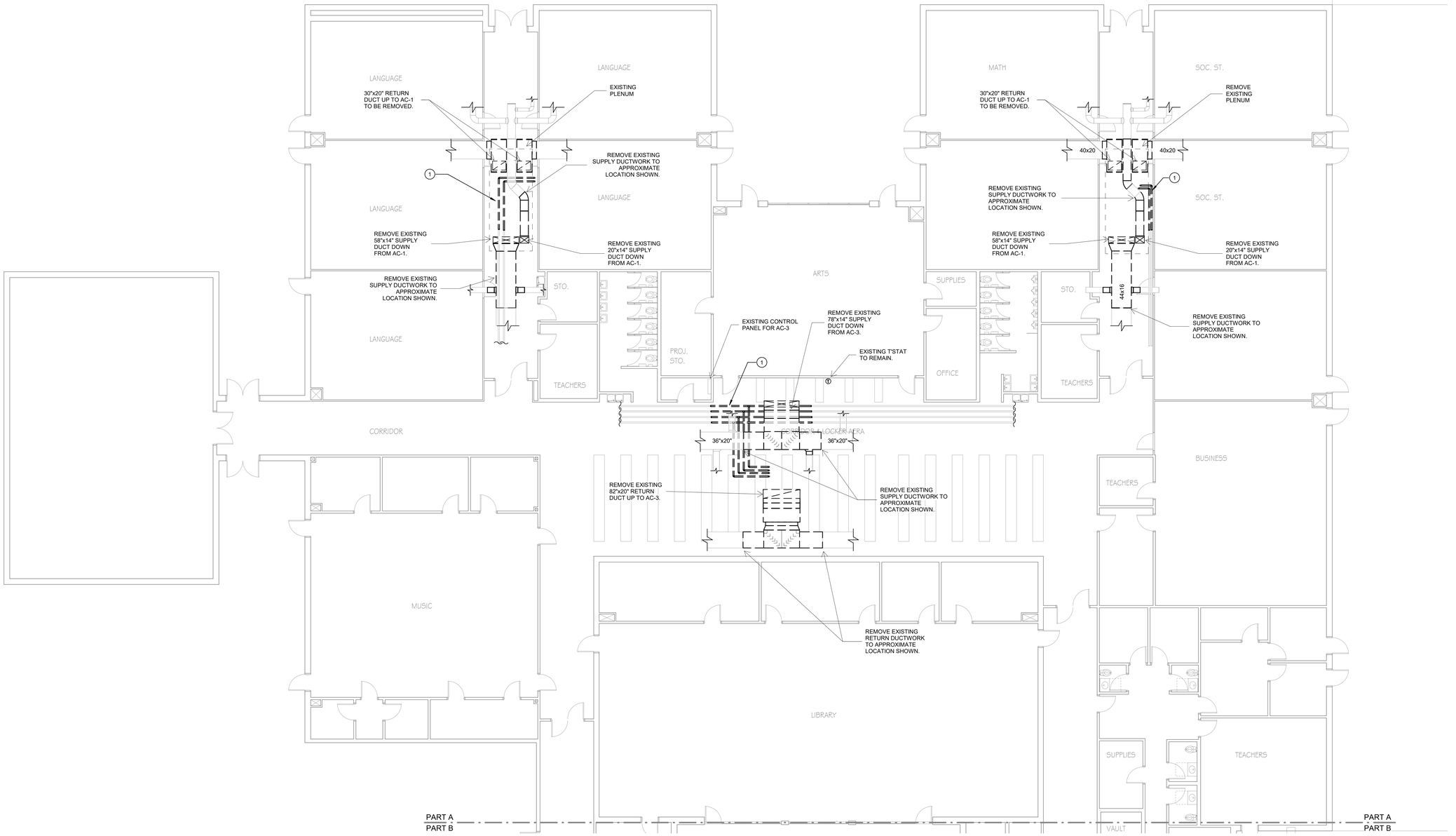
HVAC DEMO & NEW WORK LEGEND

HVAC	DESCRIPTION
	EXISTING WORK TO REMAIN
	DEMO
	NEW WORK
	CONNECTION TO EXISTING



1 HVAC - DEMOLITION FLOOR PLAN - PART A
1/8" = 1'-0"

KEY NOTE

1 REMOVE PIPE INSULATION IN AREA INDICATED.

GENERAL NOTE:

1. PRIOR TO DEMOLITION, CONTRACTOR TO FIELD VERIFY EXISTING DUCTWORK LOCATION THAT WILL BE DEMOLISHED. REPORT TO DESIGNER OF ANY FIELD CONDITION DISCREPANCY
2. UNISTALL AND KEEP EXISTING DUCT SMOKE DETECTOR ASSOCIATED WITH DUCTWORK THAT IS BEING REMOVED. DUCT SMOKE DETECTORS TO BE REUSED IN NEW DUCTWORK.

EDMONDS
Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

HVAC WORK
11.08.19
STATE OF TENNESSEE

YORK MAIN BUILDING - HVAC REPLACEMENT

701 N Main St,
Jamestown, TN 38556

HVAC - DEMOLITION FLOOR PLAN - PART A

REVISIONS

NO	DESCRIPTION	DATE
	REVISED	02-11-20

BNA19125

M1.01

DATE: 11-08-19

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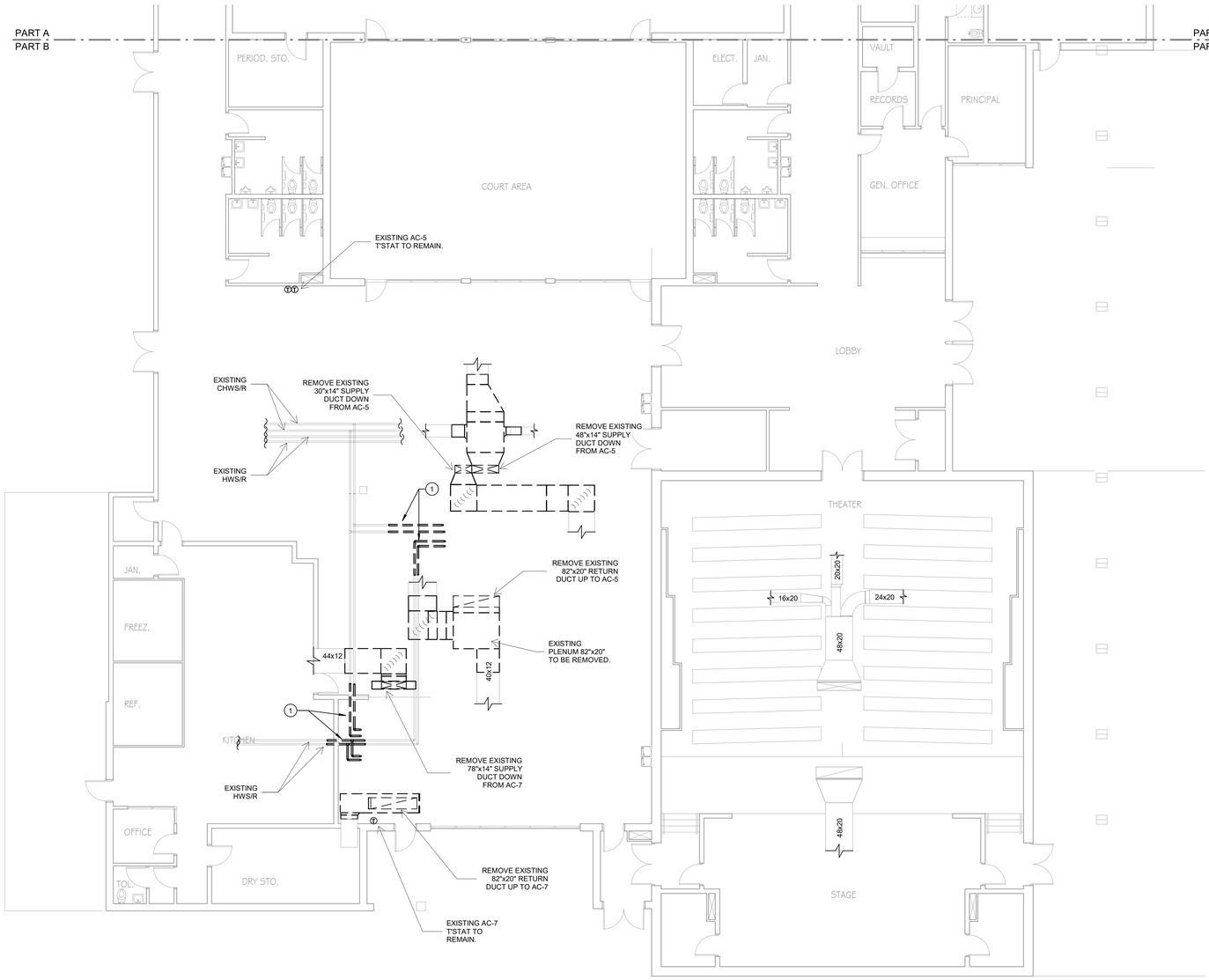
HVAC DEMO & NEW WORK LEGEND	
HVAC	DESCRIPTION
	EXISTING WORK TO REMAIN
	DEMO
	NEW WORK
	CONNECTION TO EXISTING



1 HVAC - DEMOLITION FLOOR PLAN - PART B
1/8" = 1'-0"

KEY NOTE

1 REMOVE PIPE INSULATION IN AREA INDICATED.

GENERAL NOTE:

1. PRIOR TO DEMOLITION, CONTRACTOR TO FIELD VERIFY EXISTING DUCTWORK LOCATION THAT WILL BE DEMOLISHED. REPORT TO DESIGNER OF ANY FIELD CONDITION DISCREPANCY
2. UNISTALL AND STORE DUCT SMOKE DETECTOR TO REINSTALL IN NEW DUCTWORK.

EDMONDS Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

TRACY A. WORLEY
LICENSED PROFESSIONAL ENGINEER
AGRICULTURE
11.08.19
No. 107351
STATE OF TENNESSEE

YORK MAIN BUILDING - HVAC REPLACEMENT

701 N Main St,
Jamestown, TN 38556

HVAC - DEMOLITION FLOOR PLAN - PART B

REVISIONS		
NO	DESCRIPTION	DATE
	REVISED	02-11-20

BNA19125

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DATE: 11-08-19

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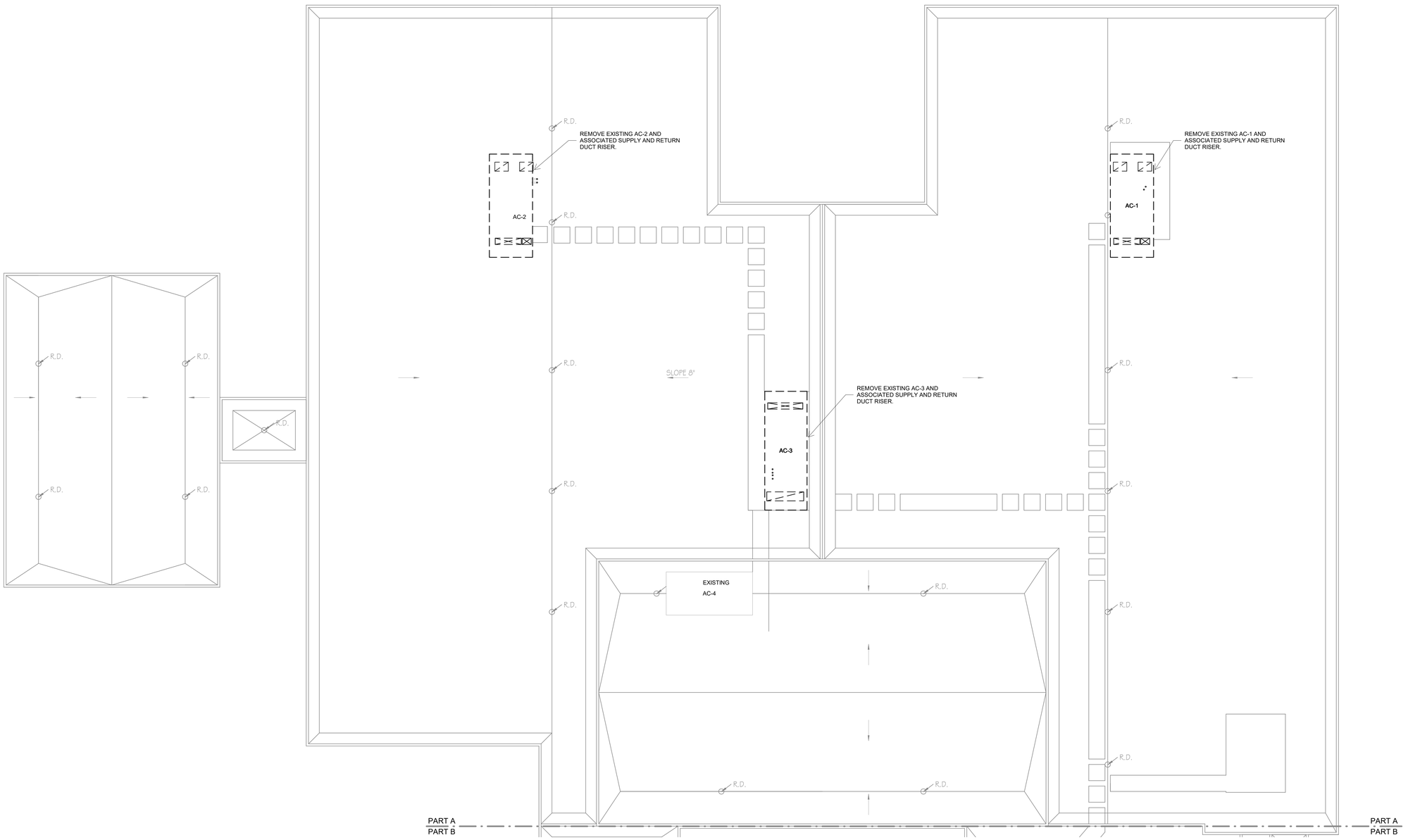
HVAC DEMO & NEW WORK LEGEND	
HVAC	DESCRIPTION
———	EXISTING WORK TO REMAIN
— — —	DEMO
———	NEW WORK
◉	CONNECTION TO EXISTING



1 HVAC - DEMOLITION ROOF PLAN - PART A
1/8" = 1'-0"

GENERAL NOTE:

1. PRIOR TO DEMOLITION, CONTRACTOR TO FIELD VERIFY EXISTING DUCTWORK LOCATION, CHILLED WATER PIPING, AND HOT WATER PIPING THAT WILL BE DEMOLISHED. REPORT TO EOR OF ANY FIELD CONDITION DISCREPANCY

EDMONDS
Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

YORK MAIN BUILDING - HVAC REPLACEMENT

701 N Main St,
Jamestown, TN 38556

HVAC - DEMOLITION ROOF PLAN - PART A

REVISIONS		
NO	DESCRIPTION	DATE
	REVISED	02-11-20

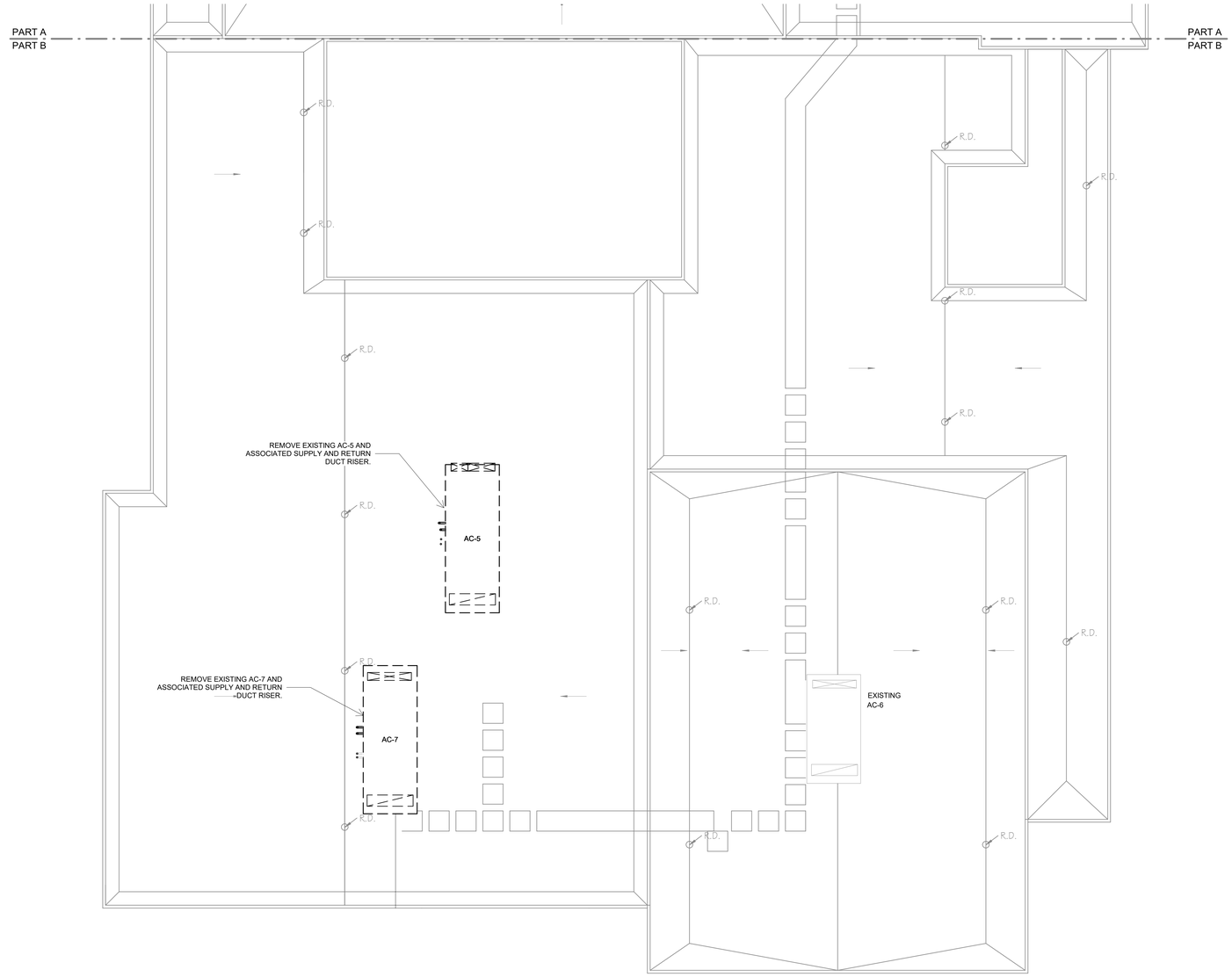
BNA19125

M1.11

DATE: 11-08-19

2/11/2020 5:05:25 PM

HVAC DEMO & NEW WORK LEGEND	
HVAC	DESCRIPTION
	EXISTING WORK TO REMAIN
	DEMO
	NEW WORK
	CONNECTION TO EXISTING



1 HVAC - DEMOLITION ROOF PLAN - PART B
1/8" = 1'-0"

GENERAL NOTE:

1. PRIOR TO DEMOLITION, CONTRACTOR TO FIELD VERIFY EXISTING DUCTWORK LOCATION, CHILLED WATER PIPING, AND HOT WATER PIPING THAT WILL BE DEMOLISHED. REPORT TO EOR OF ANY FIELD CONDITION DISCREPANCY
2. CONTRACTOR TO DISCONNECT AND CAP CHW, HW, AND MCD PIPING PRIOR TO DEMOLTION OF RTU.

EDMONDS
Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

TRACY A. WORLEY
LICENSED PROFESSIONAL ENGINEER
AGRICULTURE
11.08.19
No. 107351
STATE OF TENNESSEE

YORK MAIN BUILDING - HVAC REPLACEMENT
701 N Main St,
Jamestown, TN 38556

HVAC - DEMOLITION ROOF PLAN - PART B

REVISIONS		
NO	DESCRIPTION	DATE
	REVISED	02-11-20

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DATE: 11-08-19

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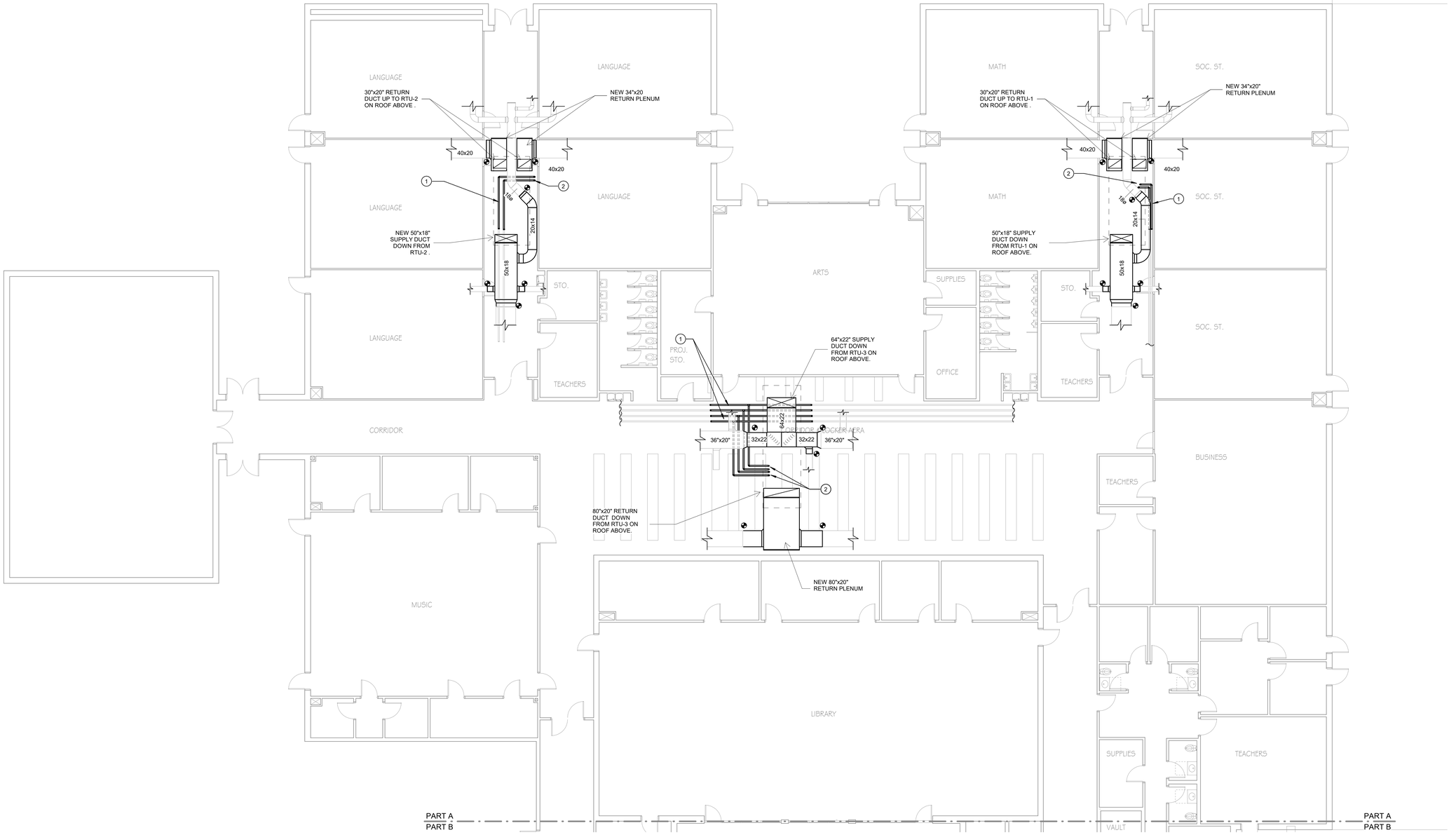
HVAC DEMO & NEW WORK LEGEND

HVAC	DESCRIPTION
	EXISTING WORK TO REMAIN
	DEMO
	NEW WORK
	CONNECTION TO EXISTING



1 HVAC - FLOOR PLAN - PART A
1/8" = 1'-0"

KEY NOTE

1. PROVIDE NEW INSULATION ON EXISTING PIPING IN AREA INDICATED
2. MODIFY CHWS/R & HWS/R PIPING IN RISER AS REQUIRED TO CONNECT TO NEW UNIT.

GENERAL NOTE:

1. REINSTALL EXISTING DUCT SMOKE DETECTOR IN NEW DUCTWORK.

EDMONDS
Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

HVAC WORKING
AGRICULTURE
11.08.19
No. 107351
STATE OF TENNESSEE

YORK MAIN BUILDING - HVAC REPLACEMENT

701 N Main St,
Jamestown, TN 38556

HVAC - FLOOR PLAN - PART A

REVISIONS

NO	DESCRIPTION	DATE
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HVAC DEMO & NEW WORK LEGEND	
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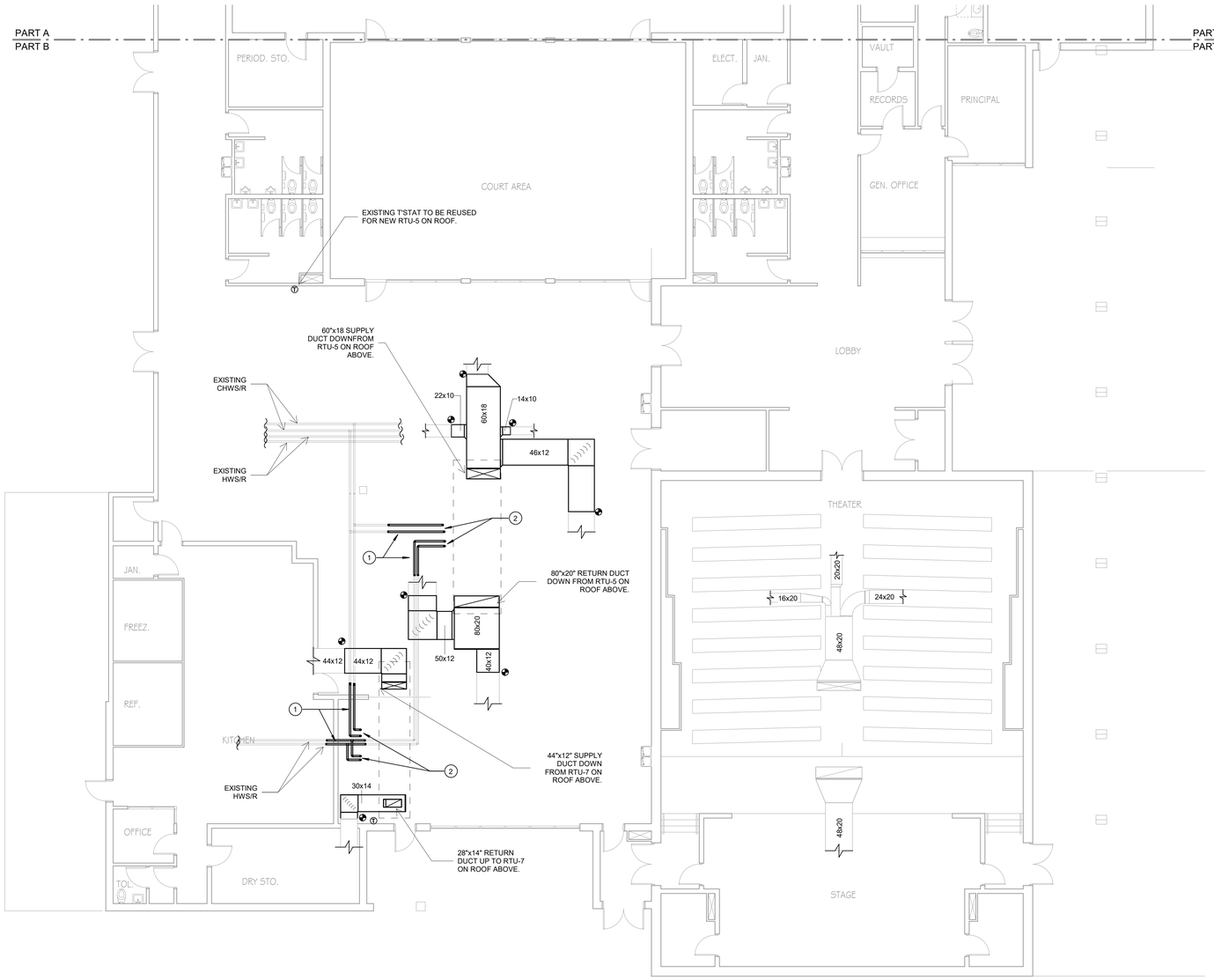

1 HVAC - FLOOR PLAN - PART B
1/8" = 1'-0"

KEY NOTE

1. PROVIDE NEW INSULATION ON EXISTING PIPING IN AREA INDICATED
2. MODIFY CHWS/R & HWS/R PIPING IN RISER AS REQUIRED TO CONNECT TO NEW UNIT.

GENERAL NOTE:

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HVAC - FLOOR PLAN - PART B

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HVAC DEMO & NEW WORK LEGEND	
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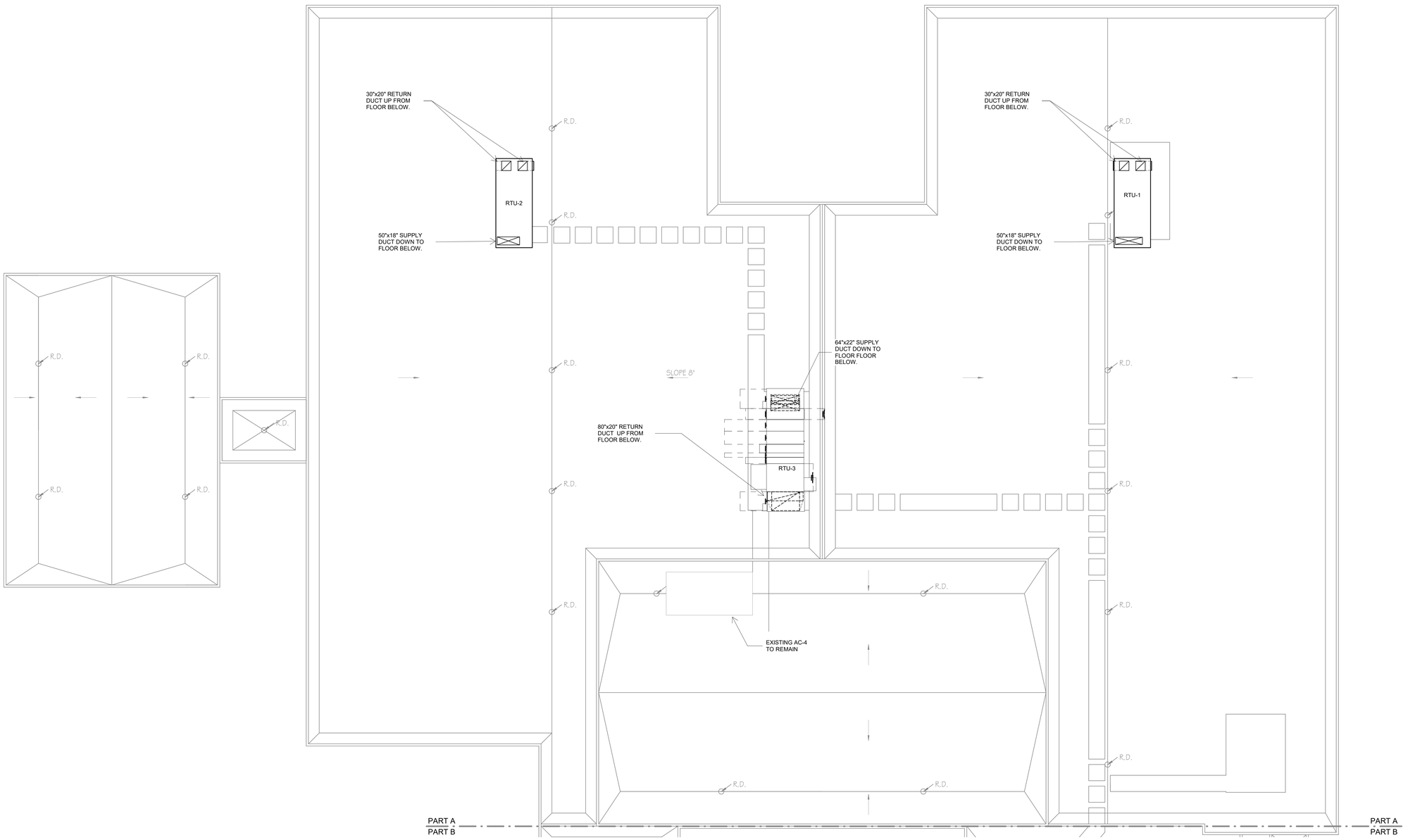

1 HVAC - ROOF PLAN - PART A
1/8" = 1'-0"

GENERAL NOTE:

1. CONTRACTOR TO CONNECT EXISTING CHW,HW, AND MCD PIPE TO NEW RTU. ROUTE NEW PIPING AS REQUIRED.

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Nashville, TN 37214
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YORK MAIN BUILDING - HVAC REPLACEMENT

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HVAC - ROOF PLAN - PART A

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HVAC DEMO & NEW WORK LEGEND	
HVAC	DESCRIPTION
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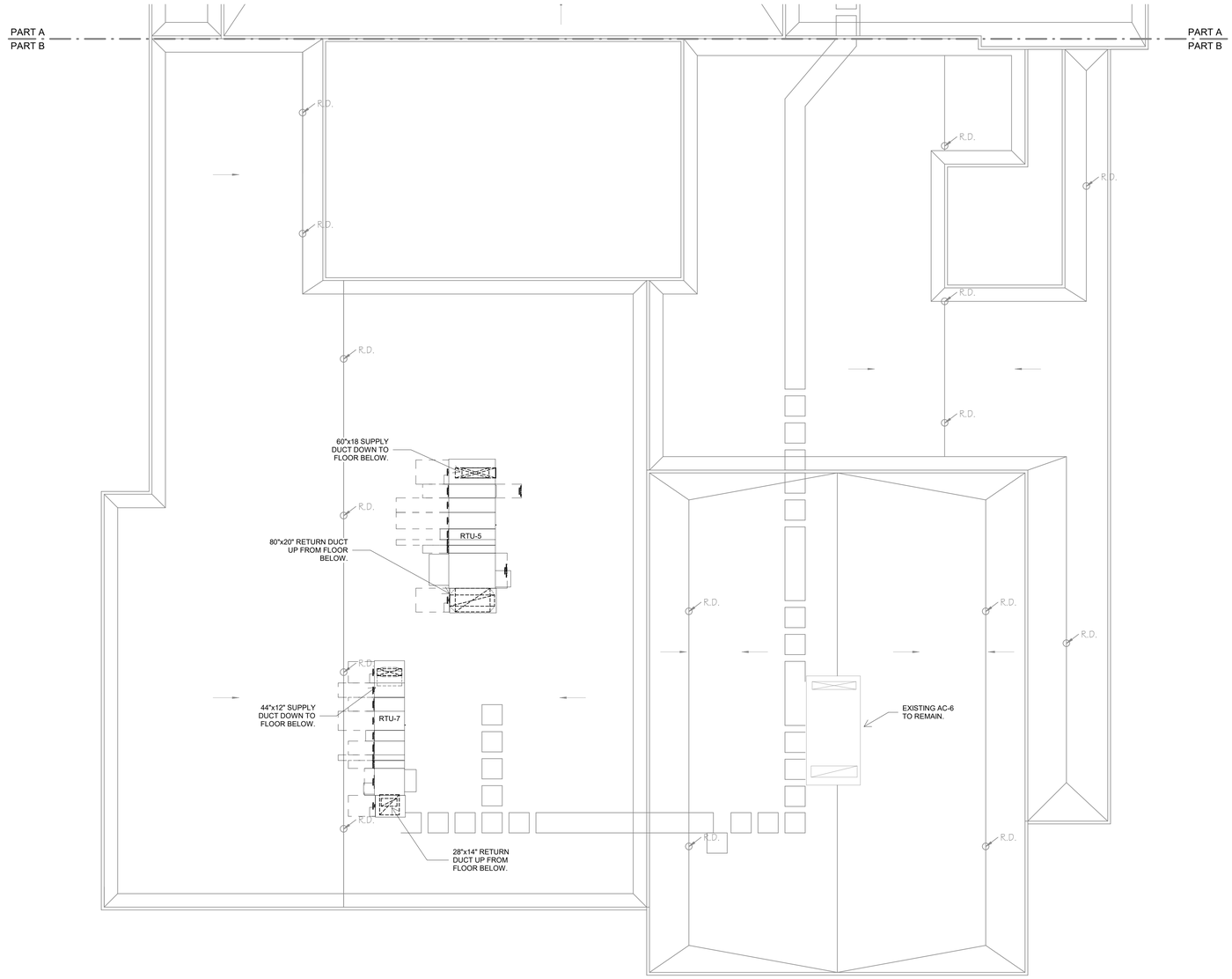

1 HVAC - ROOF PLAN - PART B
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HVAC - ROOF PLAN - PART B

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ELECTRICAL NOTES:

1. THESE DRAWINGS ARE A PART OF A COMPLETE SET OF ARCHITECTURAL/ENGINEERING CONTRACT DOCUMENTS. ELECTRICAL CONTRACTOR SHOULD REFER TO THE ARCHITECTURAL DRAWINGS FOR ACTUAL LOCATION OF ITEMS WHERE SPECIFIED. SEE SAID CONFIGURATIONS FOR WALL DEFINITIONS, ELEVATIONS, CASEWORK, REFLECTED CEILING PLAN, ETC. ROUGH-IN INSTALLATIONS WHICH ARE NOT LOCATED ACCORDING TO THE ARCHITECTURAL ELEVATIONS SHALL BE RELOCATED AT NO ADDITIONAL COST.
2. CEILING CLEARANCES ARE CRITICAL FOR THIS PROJECT. GENERAL CONTRACTOR MUST COORDINATE ALL TRADES TO AVOID POTENTIAL INTERFERENCES. CONFLICTS BETWEEN TRADES SHALL BE REFERRED TO THE ARCHITECT FOR RESOLUTION.
3. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH THE NEC AND LOCAL ORDINANCES. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS.
4. ALL SYMBOLS SHOWN ON THIS LEGEND MAY NOT BE USED.
5. ALL BRANCH CIRCUIT CONDUIT SHALL BE GALVANIZED EMT. 3/4" CONDUIT MINIMUM.
6. ALL CIRCUITS SHOWN CONCEALED SHALL BE RUN IN FURRED CEILING SPACES AND SHALL BE CONCEALED IN CONCRETE SLAB ONLY WHEN NO FURRED CEILING SPACE IS PROVIDED.
7. ALL CONDUITS CROSSING EXPANSION JOINTS SHALL HAVE EXPANSION TYPE FITTINGS.
8. ALL OUTLET BOXES MOUNTED BACK-TO-BACK IN WALLS SHALL HAVE FIREPROOF SOUND INSULATING MATERIAL INSTALLED BETWEEN THE BOXES TO PREVENT SOUND TRANSMISSION FROM ONE ROOM TO THE OTHER.
9. ALL WALL OUTLETS NOT PROVIDED WITH A DEVICE BY THIS CONTRACTOR SHALL BE PROVIDED WITH BLANK WALL PLATES.
10. ALL BRANCH CIRCUITS SHALL INCLUDE A GREEN COVERED GROUND WIRE SIZED PER NEC OR AS SHOWN. CONNECT TO EACH DEVICE AND OUTLET BOX ON THE CIRCUIT AND TO THE PANELBOARD GROUND BUS. MULTIPLE WIRE BRANCH CIRCUITS WITH COMMON NEUTRAL REQUIRE ONLY ONE GROUND WIRE. NUMBER OF WIRES SHOWN ON DRAWINGS DOES NOT INCLUDE GROUND WIRE.
11. FINAL EQUIPMENT CONNECTIONS - THIS CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL LABOR & MATERIALS REQUIRED TO MAKE FINAL CONNECTIONS TO ALL EQUIPMENT FURNISHED BY THIS CONTRACTOR AND/OR EQUIPMENT FURNISHED BY OTHERS. VERIFY ALL REQUIREMENTS, CONDUCTOR SIZE, OVERCURRENT PROTECTION, PHASE, VOLTAGE, MOTOR ROTATION, ETC., WITH EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN. PROVIDE FUSED DISCONNECT IF REQUIRED BY MANUFACTURER.
12. FURNISH & INSTALL DEVICES TO CONNECT TO EXISTING FIRE ALARM SYSTEM WHICH CONFORMS TO ALL NATIONAL, STATE, & LOCAL CODES. PROVIDE ADDITIONAL DEVICES AS REQUIRED. PROVIDE TO ARCHITECT A COMPLETE SET OF MANUFACTURER'S SYSTEM INSTALLATION PLANS INCLUDING RISER DIAGRAM, CONDUIT & WIRING, INTERCONNECTION DIAGRAMS, DEVICE LOCATIONS AND ALL REQUIRED CONNECTIONS TO EQUIPMENT FURNISHED BY OTHERS. PROVIDE CONDUIT & WIRING AS DIRECTED BY SYSTEM SUPPLIER. FIRE ALARM CONTRACTOR TO HOLD A CURRENT LICENSE TO CONDUCT BUSINESS ISSUED BY THE STATE FIRE MARSHAL'S OFFICE.
13. NEW FIRE ALARM DEVICES SHALL BE INTERFACED WITH EXISTING FIRE ALARM SYSTEM SERVING BUILDING, LOCATED IN ADMINISTRATIVE AREA. RE-PROGRAM AND TEST SYSTEM AFTER DEVICES HAVE BEEN INSTALLED. ROUTE NEW WIRING FROM NEW DEVICE TO EXISTING FIRE ALARM CIRCUIT. CONTRACTOR SHALL PROVIDE ALL NECESSARY COMPONENTS TO PROVIDE A FULLY FUNCTIONAL SYSTEM.
14. CONTRACTOR SHALL PROVIDE A COMPLETE SITE INVESTIGATION TO VERIFY EXISTING CONDITIONS PRIOR TO BID.

GENERAL NOTES:

A. UNLESS OTHERWISE NOTED, 20A/1P BREAKERS SHALL UTILIZE #12 AWG CONDUCTORS. EXCEPTION: WHERE BRANCH CIRCUIT IS IN EXCESS OF 90 LINEAR FEET, CONDUCTORS SHALL BE #10 AWG, WHERE BRANCH CIRCUIT IS IN EXCESS OF 175 LINEAR FEET, CONDUCTORS SHALL BE #8 AWG, AND WHERE BRANCH CIRCUIT IS IN EXCESS OF 260 LINEAR FEET, CONDUCTORS SHALL BE #6 AWG.

B. DEVICES INDICATED ON THIS DRAWING ARE DIAGRAMMATICAL ONLY. CONTRACTOR SHALL REFER TO ARCHITECTURAL AND INTERIOR DESIGNER'S ELEVATIONS FOR LOCATIONS OF OUTLETS, FIRE ALARM DEVICES, ETC. PRIOR TO ROUGH-IN.

C. REFERENCE MECHANICAL DRAWINGS FOR EXACT LOCATIONS AND QUANTITIES OF DUCT SMOKE DETECTORS, FIRE/SMOKE DAMPERS AND SMOKE CONTROL DAMPERS.

D. COMMUNICATIONS/SYSTEMS CONDUITS 2" DIAMETER AND LARGER SHALL HAVE A BEND RADIUS OF NO LESS THAN 10 TIMES THE CONDUIT DIAMETER.

E. MULTIWIRE BRANCH CIRCUITS SHALL BE INSTALLED PER NEC 210.4 UNLESS OTHERWISE NOTED.

F. BRANCH CIRCUIT CONDUCTORS SIZED TO PREVENT VOLTAGE DROP MAY BE REDUCED IN SIZE AS LOAD SUPPLIED BY REMAINING CIRCUIT DECREASES. VOLTAGE DROP SHALL NOT EXCEED FIVE PERCENT AT THE FARTHEST BRANCH CIRCUIT LOAD.

G. REFERENCE MECHANICAL DRAWINGS FOR MECHANICAL CONTROLS INTERFACE/REQUIREMENTS.

DEMOLITION NOTES:

1. IN AREA SHOWN, ALL ELECTRICAL EQUIPMENT, CONDUIT, WIRING, DEVICES, FIXTURES, ETC., REQUIRED TO BE REMOVED TO ALLOW FOR NEW CONSTRUCTION, ABANDONED AS A RESULT OF NEW CONSTRUCTION. OR CURRENTLY NOT IN SERVICE SHALL BE REMOVED AS PART OF THIS CONTRACT.
2. EXPOSED CONDUITS AND CONDUITS IN ACCESSIBLE AREAS SHALL BE REMOVED COMPLETELY; CONDUITS CONCEALED IN FLOORS, WALLS AND ABOVE NON-ACCESSIBLE CEILINGS MAY BE CAPPED AND ABANDONED AFTER REMOVAL OF ALL CONDUCTORS; CONDUIT FEEDING EQUIPMENT FROM ABOVE DROPPED CEILING TO BE DISCONNECTED AND REMOVED BACK TO SOURCE; DAMAGE TO CEILINGS TO BE REPLACED OR REPAIRED TO MATCH EXISTING; CONTRACTOR TO MAINTAIN THE INTEGRITY OF ALL EXISTING FEED-THROUGH CIRCUITRY WHERE EXISTING ELECTRICAL EQUIPMENT HAS BEEN REMOVED FROM MIDPOINT OF CIRCUIT. NEW WIRE TO BE PULLED THE ENTIRETY OF CIRCUIT.
3. EXISTING ELECTRICAL EQUIPMENT AND CIRCUITRY NOT BEING REMOVED OR REWORKED UNDER THIS CONTRACT, BUT LOCATED SO AS TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT, SHALL REMAIN IN SERVICE. SUCH CIRCUITS, EQUIPMENT, ETC., SHALL BE EXTENDED, RELOCATED OR REMOVED AND REINSTALLED AS REQUIRED TO ACCOMMODATE NEW CONSTRUCTION.
4. REMOVE ALL EXISTING CIRCUITS SERVING EQUIPMENT SHOWN TO BE REMOVED UNDER THIS CONTRACT. CIRCUIT BREAKERS IN EXISTING PANELBOARDS ABANDONED AS A RESULT OF DEMOLITION SHALL BE REUSED WHERE AVAILABLE, AND SIZED AS SHOWN ON NEW WORK PLANS, TO SERVE NEW EQUIPMENT.
5. EXISTING FLOOR OUTLETS FOUND TO NOT BE LOCATED TO COORDINATE WITH NEW FURNITURE AND/OR PARTITION LAYOUTS SHALL BE REMOVED COMPLETELY OR REMOVED AND REINSTALLED IN NEW LOCATIONS AS DIRECTED BY THE ARCHITECT/ENGINEER. ALL FLOOR PENETRATIONS SHALL BE SEALED TO MAINTAIN FIRE RATING OF THE FLOOR AND TO ENSURE STRUCTURAL INTEGRITY.
6. EXISTING CIRCUIT BREAKERS FEEDING EXISTING LIGHTING, RECEPTACLES,OR EQUIPMENT, WHERE ENTIRE CIRCUIT HAS BEEN REMOVED, TO BE LABELED "SPARE". REUSE "SPARE" CIRCUIT BREAKERS WHERE NOTED ON DRAWINGS.
7. ALL EXISTING LIGHTING FIXTURES, RECEPTACLES, SWITCHES, ETC., BEING REMOVED AND NOT BEING RELOCATED, TO BE CLEANED AND TURNED OVER TO THE OWNER'S REPRESENTATIVE
8. CONTRACTOR TO MAINTAIN THE INTEGRITY OF ALL EXISTING CIRCUITRY TO REMAIN.
9. ALL ELECTRICAL EQUIPMENT SHOWN IS FROM ORIGINAL CONTRACT DOCUMENTS AND IS TO BE USED AS GUIDE FOR POSSIBLE EQUIPMENT LOCATIONS. CONTRACTOR TO FIELD VERIFY FOR EXACT LOCATIONS AND QUANTITIES.
10. ALL EXISTING WALLS, CEILINGS, FLOOR SLABS, ETC., BEING CUT OR DAMAGED UNDER THIS CONTRACT TO BE PATCHED BACK TO MATCH EXISTING FINISH AND FIRE PROTECTION RATING.

ABBREVIATIONS

A	AMPERES	CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
AA	AMBIENT AIR COOLED		
AIC	AMPERES INTERUPTING CAPACITY	CFOI	CONTRACTOR FURNISHED OWNER INSTALLED
AFF	ABOVE FINISHED FLOOR		
AL	ALUMINUM	OFOI	OWNER FURNISHED OWNER INSTALLED
ATS	AUTOMATIC TRANSFER SWITCH		
AWG	AMERICAN WIRE GAUGE	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
C	CONDUIT RACEWAY		
CU	COPPER		
CKTS	CIRCUITS		
CTTS	CLOSED TRANSITION TRANSFER SWITCH		
DIA	DIAMETER		
EC	ELECTRICAL CONTRACTOR	OC	ON CENTER
EM	EMERGENCY	P	POLES
EP	EXPLOSION PROOF	PF	POWER FACTOR
FA	FORCED AIR COOLED	PH	PHASES
FMC	FLEXIBLE METAL CONDUIT	PVC	POLYVINYL CHLORIDE RACEWAY
G	GROUND	RGS	RIGID GALVANIZED STEEL
H	MOUNTING HEIGHT TO CENTERLINE	UON	UNLESS OTHERWISE NOTED
HID	HIGH INTENSITY DISCHARGE	V	VOLTS
HP	HORSE POWER	W	WIRES
IG	ISOLATED GROUND	WP	WEATHERPROOF, NEMA 3R.
KVA	KILOVOLT-AMPERES		
KW	KILOWATT		
LT	LIQUID TIGHT FLEXIBLE METAL CONDUIT		
KCMIL	THOUSAND CIRCULAR MILS		
MV	MEDIUM VOLTAGE		
N	NEUTRAL		
NEC	NATIONAL ELECTRICAL CODE		
NIC	NOT IN CONTRACT		
NL	NIGHT LIGHT		

RECEPTACLES

WALL MOUNTED

- DUPLEX RECEPTACLE - NEMA 5-20R
- CONTROLLED DUPLEX RECEPTACLE - NEMA 5-20R
- GF — GROUND FAULT RECEPTACLE - NEMA 5-20R GF
- RECEPTACLE - MTD ABOVE COUNTER - NEMA 5-20R
- IG — ISOLATED GROUND RECEPTACLE - NEMA 5-20R IG
- SIMPLEX RECEPTACLE
- SPLIT WIRED RECEPTACLE (HALF CONTROLLED) - NEMA 5-20R
- WP — WEATHER PROOF RECEPTACLE - NEMA 5-20R GFCI W/ WET LOCATION COVER
- QUADRUPLEX RECEPTACLE - NEMA 5-20R
- QUADRUPLEX RECEPTACLE - MTD ABOVE COUNTER - NEMA 5-20R
- USB — DUPLEX RECEPTACLE - NEMA 5-20R WITH TWO FULL OUTPUT USB PORTS
- EWC — SINGLE RECEPTACLE - ELECTRIC WATER COOLER, GFCI.

CEILING MOUNTED

- DUPLEX RECEPTACLE

POWER

- GA — GENERATOR ALARM / ANNUNCIATOR PANEL
- MAGNETIC MOTOR STARTER
- COMBINATION MAGNETIC STARTER & DISCONNECT SWITCH
- R — RELAY
- ELECTRIC MOTOR
- DISCONNECT SWITCH, UNFUSED, 30A, 3P UNLESS OTHERWISE NOTED.
- DISCONNECT SWITCH, FUSED, 30A, 3P UNLESS OTHERWISE NOTED.
- TS — TIME CLOCK SWITCH
- VD — VARIABLE SPEED / VARIABLE FREQUENCY DRIVE
- C — CONTACTOR
- CIRCUIT BREAKER, INDIVIDUALLY ENCLOSED
- CP — CONTROL PANEL
- ATS — AUTOMATIC TRANSFER SWITCH
- MTS — MANUAL TRANSFER SWITCH
- M — METER (WITH SOCKET ASSSEMBLY)
- T — TRANSFORMER, GENERAL PURPOSE DRY-TYPE, REFER TO SCHEDULE

JUNCTION & OUTLET BOXES

- HARDWIRE CONNECTION.
- J — JUNCTION BOX - CEILING MOUNTED
- J — JUNCTION BOX - FLOOR MOUNTED
- J — JUNCTION BOX - WALL MOUNTED

SAFETY

- FIRE ALARM DOOR HOLDER
- F — FIRE ALARM HORN - STROBE
- F — FIRE ALARM PULL BOX
- S — FIRE ALARM SPEAKER - CEILING
- F — FIRE ALARM STROBE
- MIC — REMOTE MIC FOR EVACUATION
- RTS — REMOTE TEST SWITCH

PANELS

- CONTROL PANEL - BASIC SHAPE
- HVAC — CONTROL PANEL FOR HVAC EQUIPMENT
- FAA — FIRE ALARM ANNUNCIATOR
- FAC — FIRE ALARM COMMUNICATOR
- FACP — FIRE ALARM CONTROL PANEL SURFACE OR FLUSH MOUNTED. (AS SHOWN ON PLANS).
- NAC — FIRE ALARM NAC
- FATC — FIRE ALARM TERMINAL CABINET
- FTR — FIRE ALARM TRANSPONDER
- SAP — SPRINKLER ALARM PANEL
- EVAC — VOICE EVACUATION PANEL

BRANCH CIRCUITS

- CONCEALED IN CEILING, WALL, OR IN CEILING SLAB.
- CONCEALED IN OR BELOW FLOOR OR UNDERGROUND.
- CONDUIT SEAL FITTING: CROUSE-HINDS #EYS OR APPROVED EQUIVALENT.
- HOMERUN TO PANELBOARD AND 20A, 1P BREAKER, UON.
  NOTE: SHOWN 2#12 AND 1#12(G)-1/2"C.
  ——//—— 3#12 AND 1#12(G)-3/4"C
  ——///—— 4#12 AND 1#12(G)-3/4"C

  SIZE CONDUIT PER NEC FOR GREATER NUMBER OF CONDUCTORS OR AS NOTED. THE NUMBER IN THE CIRCUIT INDICATES AWG WIRE SIZE AND HASHMARKS INDICATE NUMBER OF WIRES REQUIRED. GROUND WIRE SHALL BE SIZED IN ACCORDANCE WITH NEC TABLE 250-95. NUMBER OF HASHMARKS DO NOT INCLUDE GROUND WIRE.
- RISER: UP, RUNNING TO SOURCE.
- RISER: DOWN, RUNNING TO SOURCE.

BRANCH CIRCUIT WIRING FOR LIGHTING IS SHOWN SCHEMATICALLY. EACH LUMINAIRE IS TO BE INSTALLED WITH AN INDIVIDUAL FLEXIBLE CONNECTION. FOR EXAMPLE:

SCHEMATIC REQUIRED INSTALLATION

DRAWING CONVENTIONS

- NEW WORK
- EXISTING TO REMAIN
- XR — EXISTING TO REMOVE

PANELBOARDS

- SURFACE MOUNTED PANELBOARD
- RECESSED MOUNTED PANELBOARD

EDMONDS Engineering
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ELECTRICAL - LEGEND

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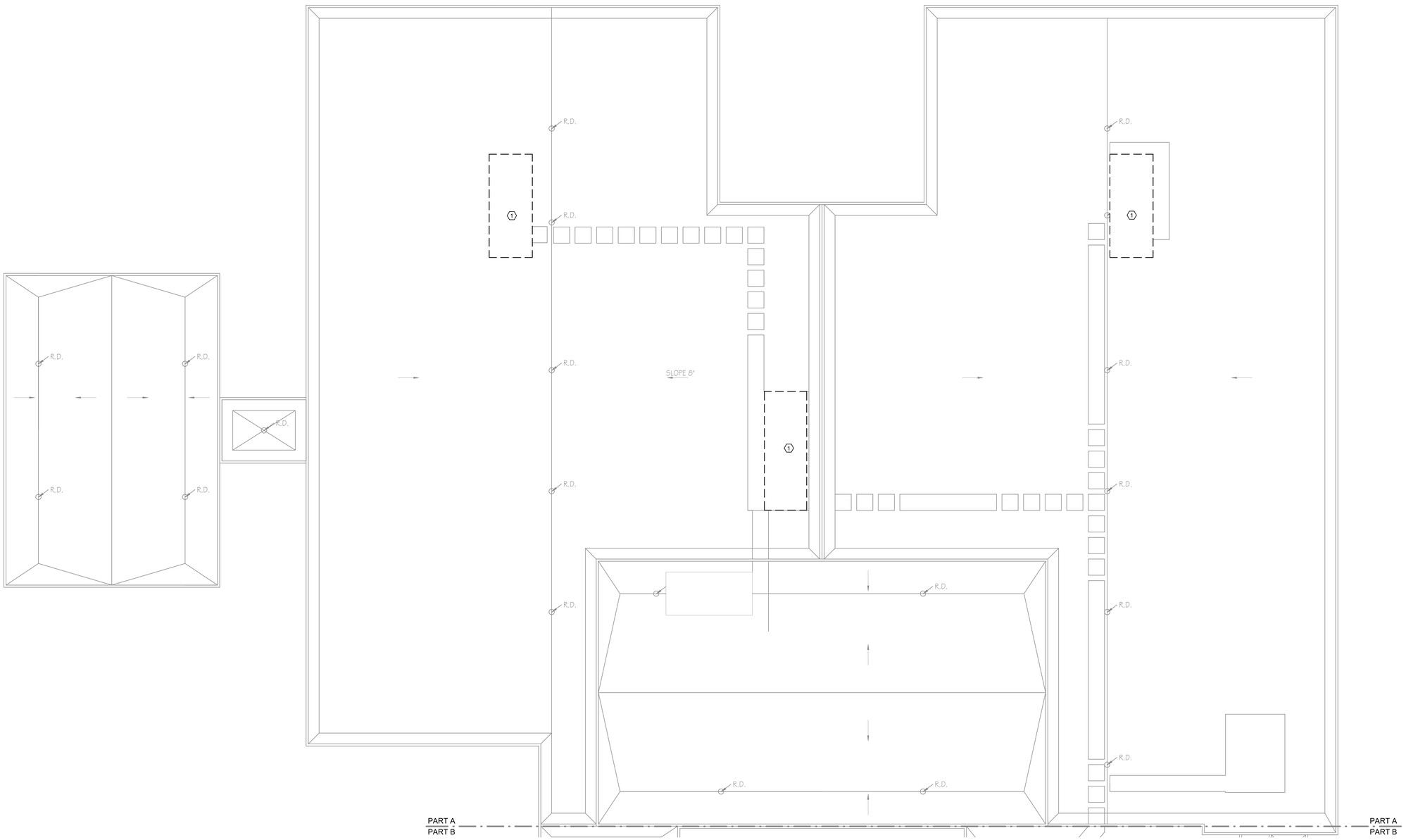

1 ELECTRICAL - DEMOLITION ROOF PLAN - PART A
1/8" = 1'-0"

KEYED NOTES:

1. MECHANICAL UNIT SHALL BE REMOVED. REMOVE EXISTING DISCONNECT AND ASSOCIATED WIRING. REMOVE ASSOCIATED DUCT SMOKE DETECTORS. MAINTAIN INTEGRITY OF EXISTING FIRE ALARM WIRING AND ELECTRICAL INFRASTRUCTURE THROUGHOUT CONSTRUCTION.

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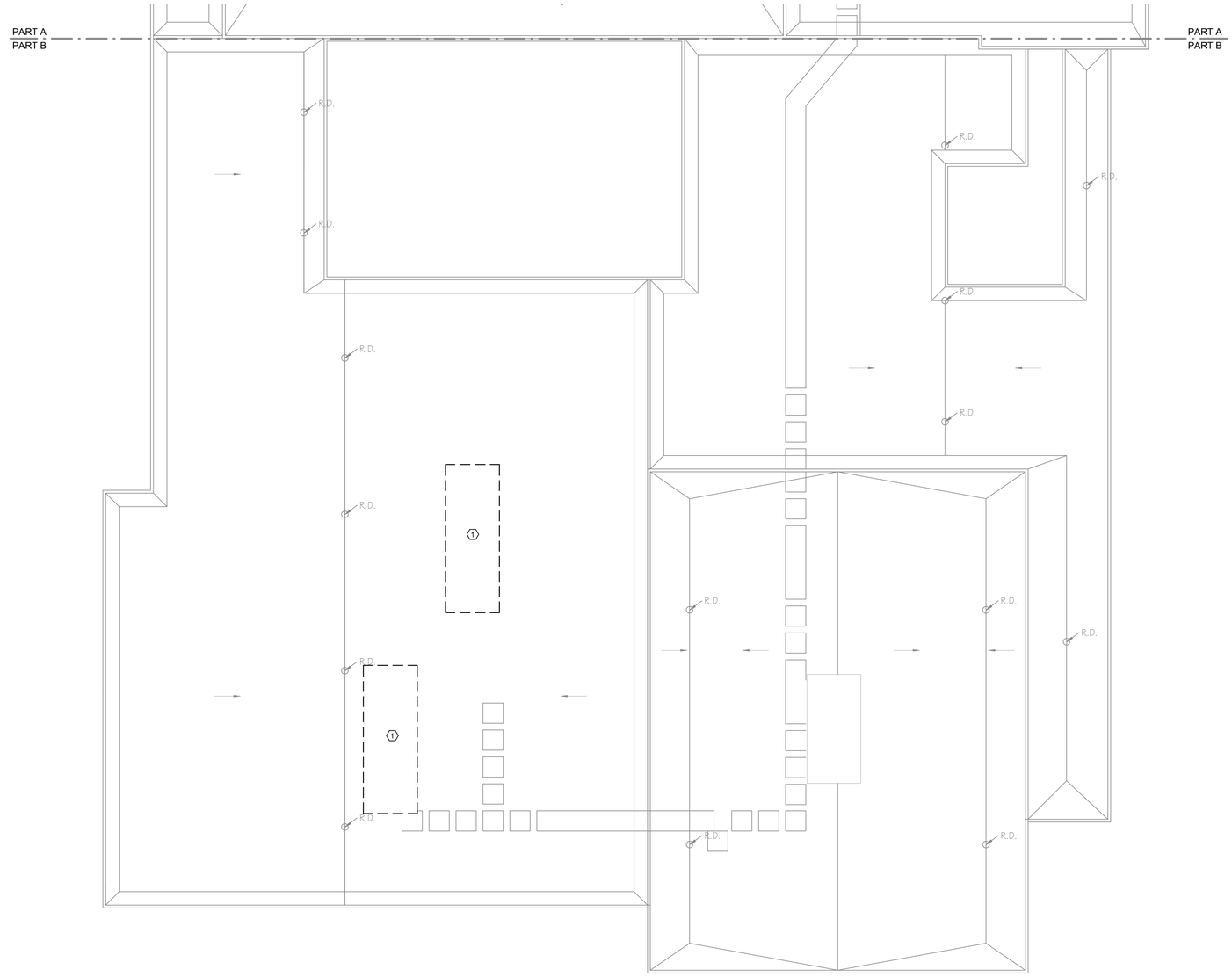

1 ELECTRICAL - DEMOLITION ROOF PLAN - PART B
1/8" = 1'-0"

KEYED NOTES: ⬡

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EDMONDS
Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

JOSEPH CAMERON EDMONDS
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 122716
STATE OF TENNESSEE

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ELECTRICAL - DEMOLITION ROOF PLAN - PART B

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GENERAL NOTES:

A. UPDATE PANELBOARD DIRECTORIES AS REQUIRED PER NEC 408.

B. FULLY COORDINATE REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLATION.

C. CONTRACTOR TO PERFORM A COMPLETE SITE INVESTIGATION TO VERIFY EXISTING CONDITIONS PRIOR RO BID.

D. ALL NEW BREAKERS PROVIDED SHALL BE AS RECOMMENDED BY EXISTING ELECTRICAL EQUIPMENT MANUFACTURER. BREAKERS SHALL MATCH EQUIPMENT AIC RATING.

E. EXISTING EXISTING EQUIPMENT INDICATED SHALL REMAIN AND SHALL BE USED FOR REFERENCE ONLY.

1 ELECTRICAL - FLOOR PLAN - PART A
1/8" = 1'-0"

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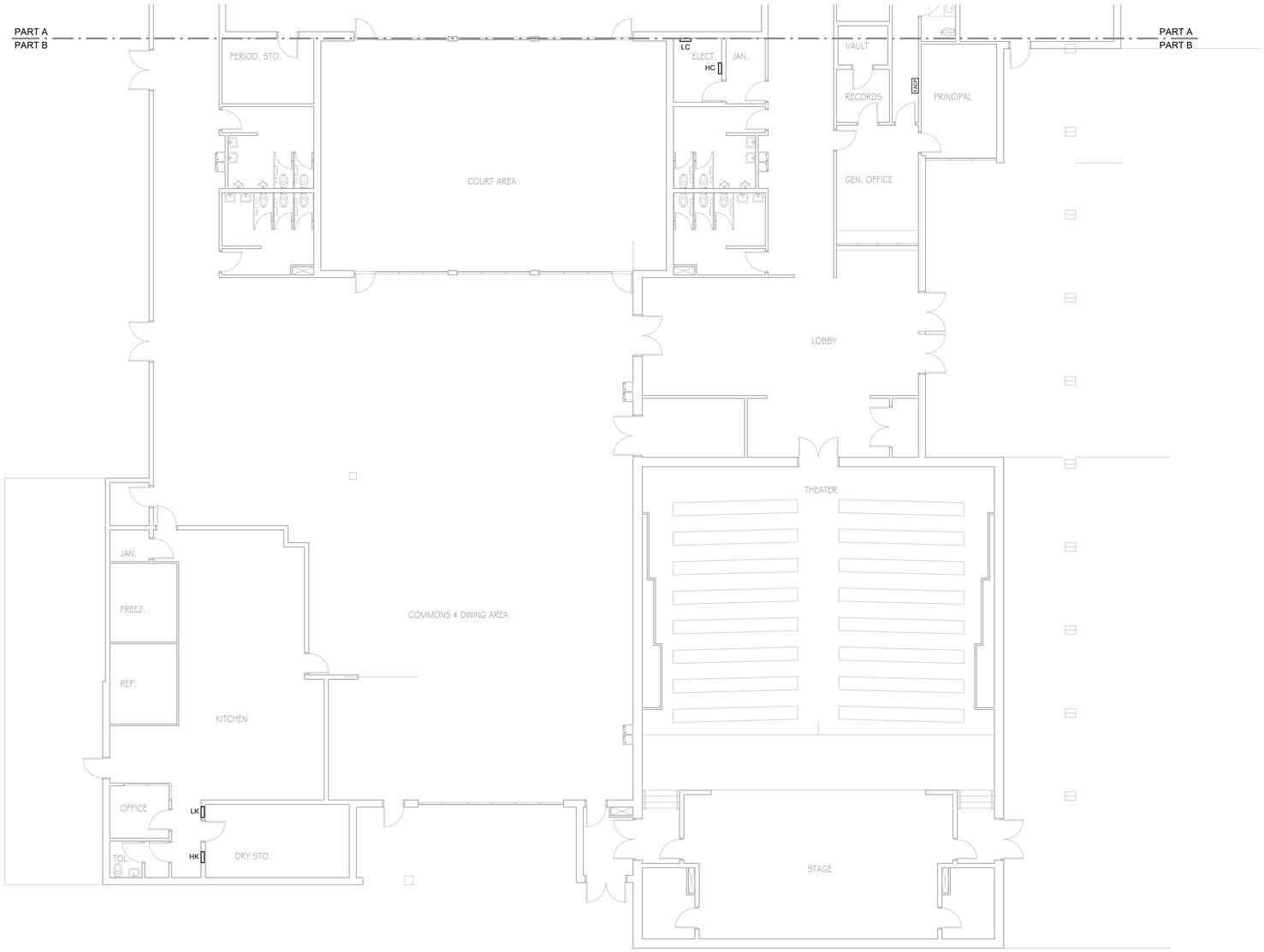

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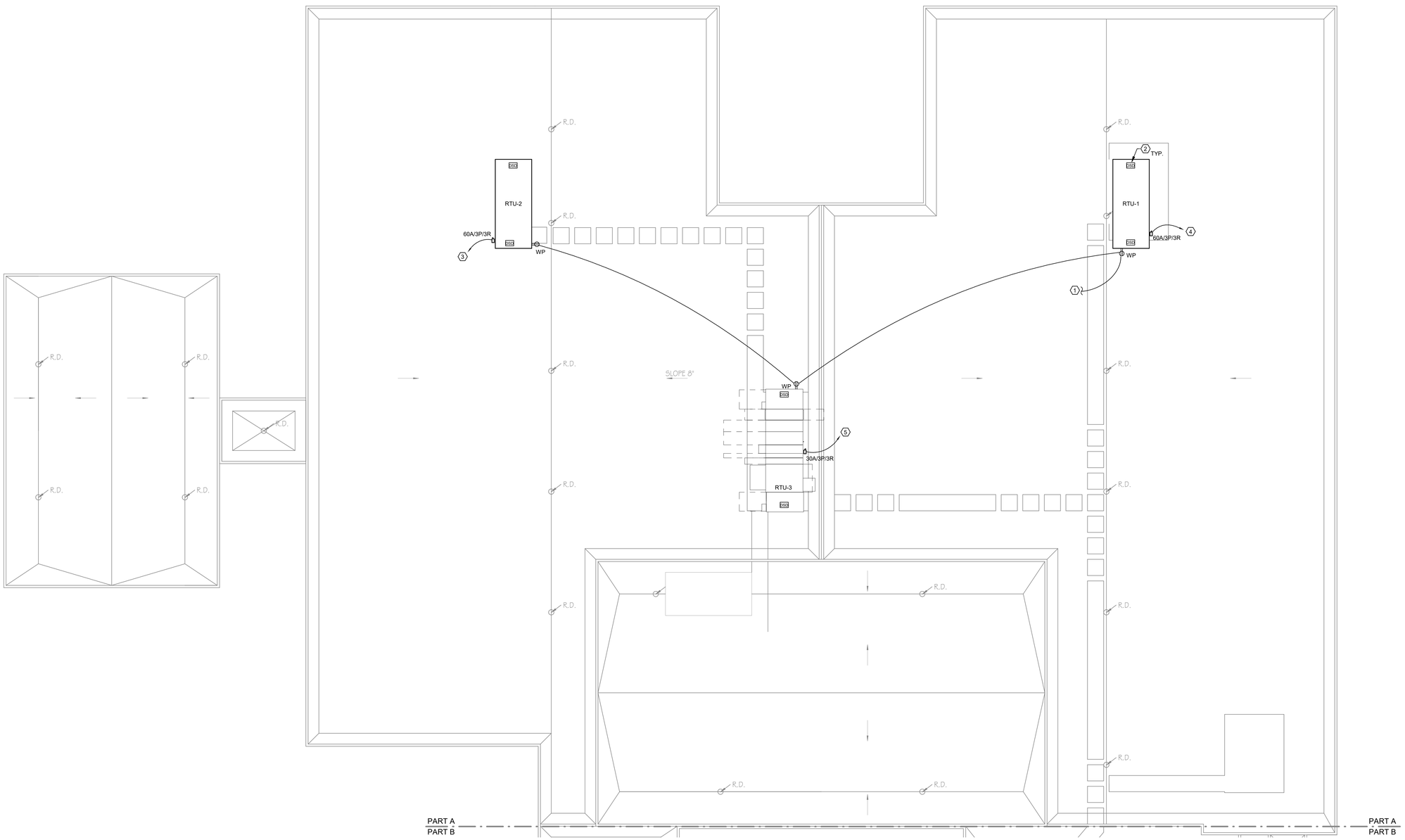

1 POWER - ROOF PLAN - PART A
1/8" = 1'-0"

GENERAL NOTES:

A. UPDATE PANELBOARD DIRECTORIES AS REQUIRED PER NEC 408.

B. FULLY COORDINATE REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLATION.

C. CONTRACTOR TO PERFORM A COMPLETE SITE INVESTIGATION TO VERIFY EXISTING CONDITIONS PRIOR RO BID.

D. BREAKER SIZES INDICATED FOR MECHANICAL EQUIPMENT ARE PER EXISTING DOCUMENTS. IF EXISTING BREAKERS FOR RE-USE DO NOT EXIST, PROVIDE NEW BREAKERS.

E. ALL NEW BREAKERS PROVIDED SHALL BE AS RECOMMENDED BY EXISTING ELECTRICAL EQUIPMENT MANUFACTURER. BREAKERS SHALL MATCH EQUIPMENT AIC RATING.

KEYED NOTES:

1. CONNECT TO EXISTING CONVENIENCE OUTLET CIRCUIT ON ROOF IN THIS AREA. IF CIRCUIT IS GREATER THAN 50'-0" AWAY, PROVIDE A NEW 20A/1P BREAKER IN PANELBOARD 'LC'.
2. INTERFACE NEW DUCT SMOKE DETECTORS WITH EXISTING FIRE ALARM SYSTEM SERVING BUILDING. RE-TEST AND TROUBLESHOOT FIRE ALARM SYSTEM FOR FUNCTIONALITY AFTER INSTALLATION.
3. PROVIDE 3#6, #10G, IN 1"C. TO A NEW 50A/3P BREAKER IN EXISTING PANELBOARD 'HC'. REMOVE EXISTING 70A/3P BREAKER AS REQUIRED FOR NEW BREAKER. ROUTE TO NEW VFD SERVING UNIT.
4. PROVIDE 3#6, #10G, IN 1"C. TO A NEW 50A/3P SWITCH IN EXISTING MOTOR CONTROL CENTER 'MCC'. REMOVE EXISTING 70A/3P SWITCH/ STARTER AS REQUIRED FOR NEW SWITCH. ROUTE TO NEW VFD SERVING UNIT.
5. PROVIDE 3#10, #10G, IN 1"C. TO A NEW 30A/3P BREAKER IN EXISTING PANELBOARD 'HC'. REMOVE EXISTING 40A/3P BREAKER AS REQUIRED FOR NEW BREAKER. ROUTE TO NEW VFD SERVING UNIT.

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EDMONDS
Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

YORK MAIN BUILDING - HVAC REPLACEMENT
701 N Main St,
Jamestown, TN 38556

ELECTRICAL - ROOF PLAN - PART A

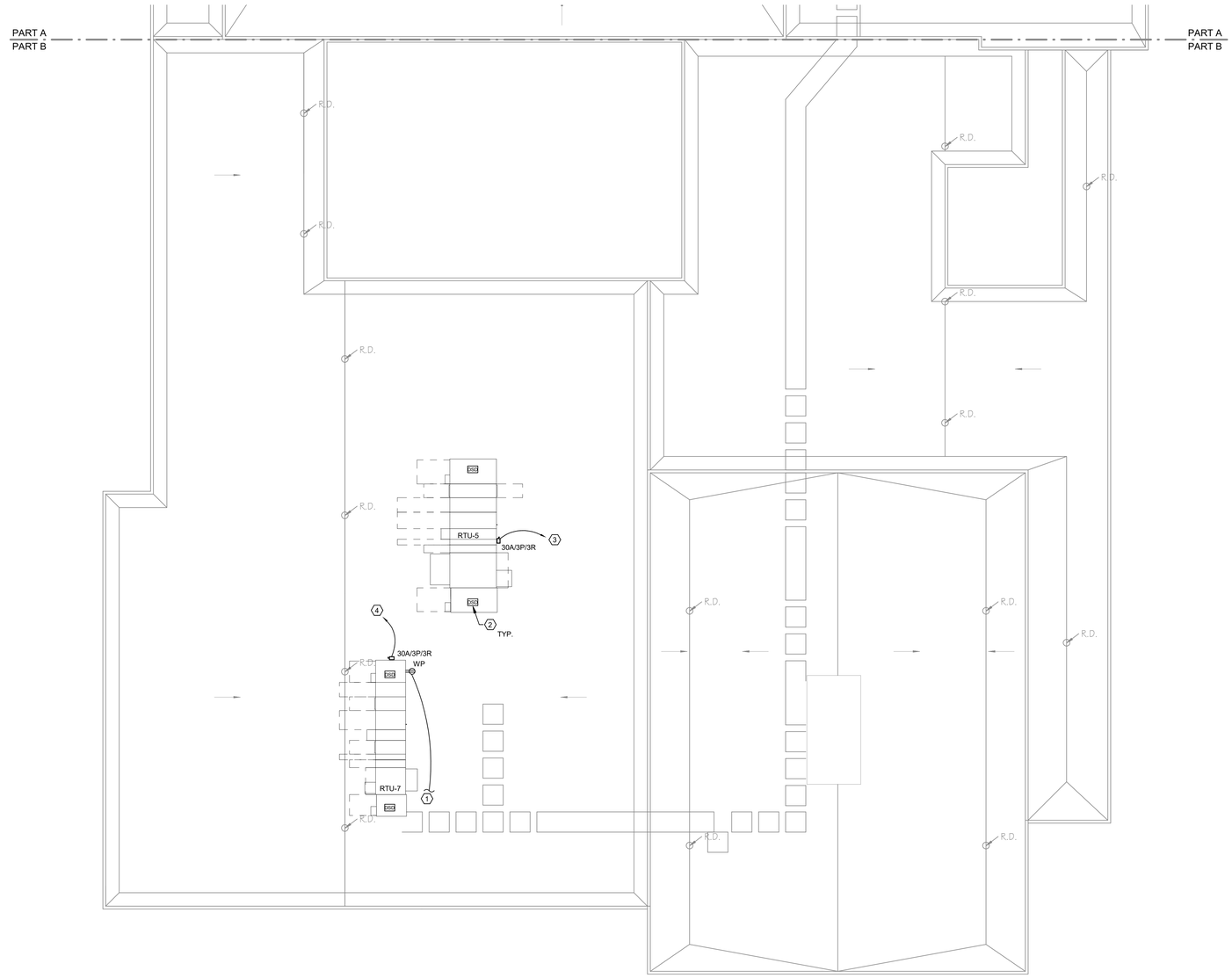
REVISIONS

NO	DESCRIPTION	DATE
	REVISED	02-11-20

BNA19125

E2.11

DATE: 11-08-19



1 ELECTRICAL - ROOF PLAN - PART B
1/8" = 1'-0"

GENERAL NOTES:

A. UPDATE PANELBOARD DIRECTORIES AS REQUIRED PER NEC 408.

B. FULLY COORDINATE REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLATION.

C. CONTRACTOR TO PERFORM A COMPLETE SITE INVESTIGATION TO VERIFY EXISTING CONDITIONS PRIOR RO BID.

D. BREAKER SIZES INDICATED FOR MECHANICAL EQUIPMENT ARE PER EXISTING DOCUMENTS. IF EXISTING BREAKERS FOR RE-USE DO NOT EXIST, PROVIDE NEW BREAKERS.

E. ALL NEW BREAKERS PROVIDED SHALL BE AS RECOMMENDED BY EXISTING ELECTRICAL EQUIPMENT MANUFACTURER. BREAKERS SHALL MATCH EQUIPMENT AIC RATING.

KEYED NOTES:

1. CONNECT TO EXISTING CONVENIENCE OUTLET CIRCUIT ON ROOF IN THIS AREA.
2. INTERFACE NEW DUCT SMOKE DETECTORS WITH EXISTING FIRE ALARM SYSTEM SERVING BUILDING. RE-TEST AND TROUBLESHOOT FIRE ALARM SYSTEM FOR FUNCTIONALITY AFTER INSTALLATION.
3. PROVIDE 3#10, #10G, IN 1"C. TO A NEW 30A/3P BREAKER IN EXISTING PANELBOARD 'HK'. REMOVE EXISTING 40A/3P BREAKER AS REQUIRED FOR NEW BREAKER. ROUTE TO NEW VFD SERVING UNIT.
4. PROVIDE 3#12, #12G, IN 3/4"C. TO EXISTING 20A/3P BREAKER IN EXISTING PANELBOARD 'HK'. ROUTE TO NEW VFD SERVING UNIT. INTERFACE NEW UNIT WITH EXISTING KITCHEN HOOD CONTROL PANEL.

2/11/2020 5:05:22 PM

EDMONDS
Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

YORK MAIN BUILDING - HVAC REPLACEMENT
701 N Main St,
Jamestown, TN 38556

ELECTRICAL - ROOF PLAN - PART B

REVISIONS

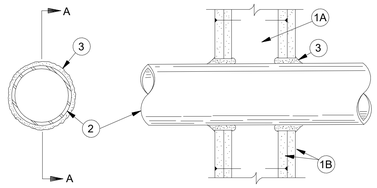
NO	DESCRIPTION	DATE
	REVISED	02-11-20

BNA19125

E2.12

DATE: 11-08-19

SYSTEM NO. W-L-1001
JUNE 15, 2005
F RATINGS - 1, 2, 3 AND 4 HR (SEE ITEMS 2 AND 3)
T RATINGS - 0, 1, 2, 3, AND 4 HR (SEE ITEM 3)
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT
L RATING AT 400 F - LESS THAN 1 CFM/SQ FT



SECTION A-A

1. WALL ASSEMBLY - THE 1, 2, 3 OR 4 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

A. STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS (MAX 2 H FIRE RATED ASSEMBLIES) OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (406 MM) OC WITH NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3-5/8 IN. (92 MM) WIDE BY 1-3/8 IN. (35 MM) DEEP CHANNELS SPACED MAX 24 IN. (610 MM) OC.

B. GYPSUM BOARD* - NOM OR HIN. (13 OR 16 MM) THICK, 4 FT. (122 H 1/20CM) WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 26 IN. (660 MM).

2. THROUGH-PENETRANT - ONE METALLIC PIPE, CONDUIT OR TUBING INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE, CONDUIT OR TUBING AND PERIPHERY OF OPENING SHALL BE MIN OF 0 IN / (0 MM). (POINT CONTACT) TO MAX 2 IN. (51 MM) PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:

A. STEEL PIPE - NOM 24 IN. (610 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

B. IRON PIPE - NOM 24 IN. (610 MM) DIAM (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 12 IN (305 MM) DIAM (OR SMALLER) OR CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE.

C. CONDUIT - NOM 6 IN. (152 MM) DIAM (OR SMALLER) STEEL CONDUIT OR NOM 4 IN (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING

D. COPPER TUBING - NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING

E. COPPER PIPE - NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

F. THROUGH PENETRATING PRODUCT* - FLEXIBLE METAL PIPING THE FOLLOWING TYPES OF STEEL FLEXIBLE METAL GAS PIPING MAY BE USED:

1. NOM 2 IN. (51 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. OMEGA FLEX INC

2. NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OFFLOOR OR WALL ASSEMBLY. GASTITE, DIV OF TITEFLEX

3. NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. WARD MFG INC

3. FILL, VOID OR CAVITY MATERIAL* - CAULK OR SEALANT - MIN 5/8. , 1-1/4,1-7/8 AND 2-1/2 IN. (16, 32, 48 AND 64 MM) THICKNESS OF CAULK FOR 1, 2, 3 AND 4 HR RATED ASSEMBLIES, RESPECTIVELY, APPLIED WITHIN ANNULUS, FLUSH ¼ IN. (6 MM) DIAM BEAD OF CAULK APPLIED TO GYPSUM BOARD/PENETRANT INTERFACE AT POINT CONTACT LOCATION ON BOTH SIDES OFWALL. THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS SHOWN IN THE FOLLOWING TABLE. THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE TYPE OR SIZE OF THE PIPE OR CONDUIT AND THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS TABULATED BELOW:

Maximum Pipe or Conduit Diameter Inches	F Rating Hours	F Rating Hours
1 (25)	1 or 2	0+, 1 or 2
1 (25)	3 or 4	3 or 4
4 (102)	1 or 2	0
6 (152)	3 or 4	0
12 (305)	1 or 2	0

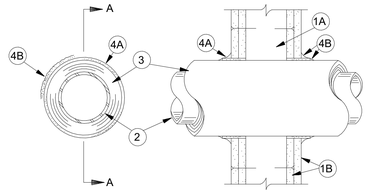
+WHEN COPPER PIPE IS USED, T RATING IS 0
H.3M COMPANY - CP 25WB+ OR FB-3000 WT.

*BEARING THE UL CLASSIFICATION MARK LAST UPDATED ON 2005-06-15

UL LISTED AND CLASSIFIED PRODUCTS UL RECOGNIZED COMPONENTS PRODUCTS CERTIFIED FOR CANADA

THROUGH-PENETRATION FIRESTOP SYSTEMS
W-L-1001
No Scale
1

SYSTEM NO. W-L-5001
MAY 19, 2005
F RATINGS - 1 AND 2 HR (SEE ITEM 1)
T RATINGS - 3/4 , 1 AND 1 1/2 HR (SEE ITEM 3)
L RATING AT AMBIENT - 2 CFM/SQ FT
L RATING AT 400 F - LESS THAN 1 CFM/SQ FT



SECTION A-A

1. WALL ASSEMBLY - THE 1 OR 2 HR FIRE-RATED GYPSUM BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300, U400 OR V400 SERIES WALL OR PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

A. STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (406 MM) OC WITH NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3-5/8 IN. (92 MM) WIDE BY 1-3/8 IN. (35 MM) DEEP CHANNELS SPACED MAX 24 IN. (610 MM) OC.

B. GYPSUM BOARD* - NOM 5/8 IN. (16 MM) THICK. 4 FT (122 CM) WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM BOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 14-1/2 (368MM) IN FOR WOOD STUD WALLS AND 18 IN. (457 MM) FOR STEEL STUD WALLS.
THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS 1 HR WHEN INSTALLED IN A 1 HR FIRE RATED WALL AND 2 HR WHEN INSTALLED IN A 2 HR FIRE RATED WALL.

2. THROUGH PENETRANTS - ONE METALLIC PIPE OR TUBING TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. PIPE OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:

A. STEEL PIPE - NOM 12 IN. (305 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

B. COPPER TUBING - NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

C. COPPER PIPE - NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. PIPE COVERING* - NOM 1 OR 2 IN. (25 OR 51 MM) THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN 3.5 PCF OR 56 KG/M3) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY-APPLIED SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SEALED WITH METAL FASTENERS OR WITH BUTT STRIP TAPE SUPPLIED WITH THE PRODUCT. WHEN NOM 1 IN. (25 MM) THICK PIPE COVERING IS USED, THE ANNULAR SPACE BETWEEN THE PIPE COVERING AND THE CIRCULAR CUTOUT IN THE GYPSUM WALLBOARD LAYERS ON EACH SIDE OF THE WALL SHALL BE MIN 1/4 IN. (6 MM) TO MAX 3/8 IN. (10 MM) WHEN NOM 2 IN. (51 MM) THICK PIPE COVERING IS USED, THE ANNULAR SPACE BETWEEN THE PIPE COVERING AND THE CIRCULAR CUTOUT IN THE GYPSUM BOARD LAYERS ON EACH SIDE OF THE WALL SHALL BE MIN 1/2 IN. (13 MM) TO MAX 3/4 IN. (19 MM)
SEE PIPE AND EQUIPMENT COVERING MATERIALS (BRGU) CATEGORY IN BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.
THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS 3/4 HR WHEN NOM 1 IN. (25 MM) THICK PIPE COVERING IS USED. THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS 1 HR AND 1-1/2 HR WHEN NOM 2 IN. (52 MM) THICK PIPE COVERING IS USED WITH 1 HR AND 2 HR FIRE RATED WALLS, RESPECTIVELY.

4. FIRESTOP SYSTEM - INSTALLED SYMMETRICALLY ON BOTH SIDES OF WALL ASSEMBLY. THE DETAILS OF THE FIRESTOP SYSTEM SHALL BE AS FOLLOWS:

A. FILL, VOID OR CAVITY MATERIALS* - WRAP STRIP - NOM 1/4 IN. (6 MM) THICK INTUMESCENT ELASTOMERIC MATERIAL FACED ON ONE SIDE WITH ALUMINUM FOIL, SUPPLIED IN 2 IN. (51 MM) WIDE STRIPS. NOM 2 IN. (51 MM) WIDE STRIP TIGHTLY WRAPPED AROUND PIPE COVERING (FOIL SIDE OUT) WITH SEAM BUTTED. WRAP STRIP LAYER SECURELY BOUND WITH STEEL WIRE OR ALUMINUM FOIL TAPE AND SLID INTO ANNULAR SPACE APPROX 1-1/4 IN. (32 MM) SUCH THAT APPROX 3/4 IN. (19 MM) OF THE WRAP STRIP WIDTH PROTRUDES FROM THE WALL SURFACE. ONE LAYER OF WRAP STRIP IS REQUIRED WHEN NOM 1 IN. (25 MM) THICK PIPE COVERING IS USED. TWO LAYERS OF WRAP STRIP ARE REQUIRED WHEN NOM 2 IN. (51 MM) THICK PIPE COVERING IS USED.

3M COMPANY - FS-195+

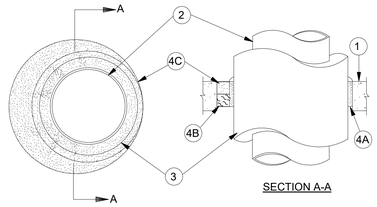
B. FILL, VOID OR CAVITY MATERIALS* - CAULK OR SEALANT 15/32 MIN 1/4 IN. (6 MM) DIAM CONTINUOUS BEAD APPLIED TO THE WRAP STRIP/WALL INTERFACE AND TO THE EXPOSED EDGE OF THE WRAP STRIP LAYER APPROX 3/4 IN. (19 MM) FROM THE WALL SURFACE.
3M COMPANY - CP 25WB+, IC 15WB+, FIREDAM 150+ CAULK OR FB-3000 WT SEALANT

*BEARING THE UL CLASSIFICATION MARK LAST UPDATED ON 2005-05-19

UL LISTED AND CLASSIFIED PRODUCTS UL RECOGNIZED COMPONENTS PRODUCTS CERTIFIED FOR CANADA

THROUGH-PENETRATION FIRESTOP SYSTEMS
W-L-5001
No Scale
2

SYSTEM NO. C-AJ-5080
AUGUST 23, 2004
F RATING - 2 HR
T RATING - 0 HR
W RATING - CLASS 1 (SEE ITEM 4)



SECTION A-A

1. FLOOR OR WALL ASSEMBLY - MIN 2-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 7-1/2 IN.
SEE CONCRETE BLOCK (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

2. THROUGH-PENETRANTS - ONE METALLIC PIPE OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. PIPE OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:

A. STEEL PIPE - NOM 4 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

B. COPPER TUBING - NOM 3 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

C. COPPER PIPE - NOM 3 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. PIPE INSULATION - PLASTICS# - NOM 1/2 TO 3/4 IN. THICK ACRYLONITRILE BUTADIENE/POLYVINYL CHLORIDE (AB/PVC) FLEXIBLE FOAM FURNISHED IN THE FORM OF TUBING. AN ANNULAR SPACE OF MIN 1/4 IN. TO MAX 1-1/4 IN. IS REQUIRED WITHIN THE FIRESTOP SYSTEM.
SEE PLASTICS (QMFZ2) CATEGORY IN THE PLASTICS RECOGNIZED COMPONENT DIRECTORY FOR NAMES OF MANUFACTURERS. ANY RECOGNIZED COMPONENT PIPE INSULATION MATERIAL MEETING THE ABOVE SPECIFICATIONS AND HAVING A UL 94 FLAMMABILITY CLASSIFICATION OF 94-5VA MAY BE USED.

4. FIRESTOP SYSTEM - THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:

A. FILL, VOID OR CAVITY MATERIALS* - WRAP STRIP - NOM 1/4 IN. THICK INTUMESCENT ELASTOMERIC MATERIAL FACED ON ONE SIDE WITH ALUMINUM FOIL, SUPPLIED IN 2 IN. WIDE STRIPS. ONE NOM 2 IN. WIDE STRIP TIGHTLY-WRAPPED AROUND PIPE INSULATION WITH THE FOIL SIDE EXPOSED AND SLID INTO THROUGH OPENING SUCH THAT THE TOP EDGE IS FLUSH WITH TOP SURFACE OF FLOOR OR EXTENDING A MAX OF 1 IN. ABOVE THE TOP SURFACE OF FLOOR. WHEN INSULATED PIPE IS INSTALLED IN THROUGH OPENINGS WITH A MAX ANNULAR SPACE BETWEEN THE INSULATED PIPE AND THE PERIPHERY OF THE OPENING OF 1/4 TO 3/8 IN., THE WRAP STRIP LAYER MAY BE SECURED IN PLACE WITH PRESSURE-SENSITIVE FOIL TAPE. IN ALL OTHER SITUATIONS, THE WRAP STRIP LAYER SHALL BE SECURED IN PLACE WITH MIN NO. 18 GAUGE GALV STEEL TIE WIRE. IN WALL ASSEMBLIES, THE WRAP STRIP LAYER IS TO BE INSTALLED ON THE INSULATED PIPE IN THE SAME MANNER USED FOR FLOOR ASSEMBLIES BUT SHALL BE INSTALLED SYMMETRICALLY ON BOTH SIDES OF THE WALL.

3M COMPANY - TYPE FS-195+

B. PACKING MATERIAL - MIN 1 IN. THICKNESS OF MIN 4 PCF MINERAL WOOL BATT INSULATION TIGHTLY PACKED INTO OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.

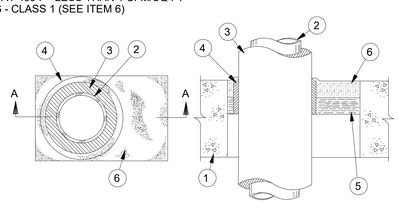
C. FILL, VOID OR CAVITY MATERIAL* - CAULK OR SEALANT - MIN 1 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS, FLUSH WITH TOP SURFACE OF FLOOR OR BOTH SURFACES OF WALL ASSEMBLY. A MIN 1/4 IN. DIAM BEAD OF CAULK SHALL BE APPLIED TO EDGE OF WRAP STRIP ON THE TOP SURFACE OF FLOOR AND ON BOTH SURFACES OF WALL ASSEMBLY.
3M COMPANY - CP 25WB+ OR FB-3000 WT

(NOTE - W RATING APPLIES ONLY WHEN FB-3000 WT IS USED.)
*BEARING THE UL CLASSIFICATION MARK
#BEARING THE UL RECOGNITION MARKING LAST UPDATED ON 2004-08-23

UL LISTED AND CLASSIFIED PRODUCTS UL RECOGNIZED COMPONENTS PRODUCTS CERTIFIED FOR CANADA

THROUGH-PENETRATION FIRESTOP SYSTEMS
C-AJ-5080
No Scale
3

SYSTEM NO. C-AJ-5017
AUGUST 23, 2004
(FORMERLY SYSTEM NO. 395)
F RATING - 3 HR
T RATINGS - 1/2 AND 1 HR (SEE ITEM 3)
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT
L RATING AT 400 F - LESS THAN 1 CFM/SQ FT
W RATING - CLASS 1 (SEE ITEM 6)



SECTION A-A

1. FLOOR OR WALL ASSEMBLY - MIN 4-1/2 IN. THICK LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS* MAX AREA OF SQUARE, RECTANGULAR OR CIRCULAR OPENING IS 45 SQ IN. WITH MAX DIMENSION OF 9 IN.
SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

2. PIPE - NOM 3 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER PIPE OR NOM 2-1/2 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE. ONE OR MORE INSULATED PIPES MAY BE INSTALLED WITH A MIN CLEARANCE OF 1/2 IN. MAINTAINED BETWEEN INSULATED PIPES AND WITH A MIN CLEARANCE OF 1/4 IN. MAINTAINED BETWEEN INSULATED PIPE AND SIDES OF THROUGH OPENING. PIPES TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.

3. PIPE INSULATION - PLASTICS# - NOM 3/4 IN. THICK ACRYLONITRILE BUTADIENE/POLYVINYL CHLORIDE (AB/PVC) FLEXIBLE FOAM FURNISHED IN THE FORM OF TUBING WITH SKIN. WHEN NOM 2-1/2 OR 3 IN. DIAM INSULATED STEEL OR COPPER PIPE IS USED, T RATING IS 1/2 HR. WHEN MAX 2 IN. DIAM INSULATED STEEL OR COPPER PIPE IS USED, T RATING IS 1 HR.
SEE PLASTICS# (QMFZ2) CATEGORY IN THE RECOGNIZED COMPONENT DIRECTORY FOR NAMES OF MANUFACTURERS. ANY RECOGNIZED COMPONENT TUBE INSULATION MATERIAL MEETING THE ABOVE SPECIFICATIONS AND HAVING A UL94 FLAMMABILITY CLASSIFICATION OF 94-5VA MAY BE USED.

4. FILL, VOID OR CAVITY MATERIALS* - WRAP STRIP - NOM 1/4 IN. THICK INTUMESCENT ELASTOMERIC MATERIAL FACED ON ONE SIDE WITH ALUMINUM FOIL, SUPPLIED IN 2 IN. WIDE STRIPS. ONE NOM 2 IN. WIDE STRIP TIGHTLY-WRAPPED AROUND PIPE INSULATION (ITEM 3) WITH THE FOIL SIDE EXPOSED AND SLID INTO THROUGH OPENING SUCH THAT THE TOP EDGE IS FLUSH WITH TOP SURFACE OF FLOOR. WHEN A SINGLE INSULATED PIPE IS INSTALLED IN A CIRCULAR THROUGH OPENING AND WHEN THE MAX ANNULAR SPACE BETWEEN THE INSULATED PIPE AND THE SIDES OF THE THROUGH OPENING IS 3/8 IN., THE WRAP STRIP LAYER MAY BE SECURED IN PLACE WITH PRESSURE-SENSITIVE TAPE. IN ALL OTHER SITUATIONS, THE WRAP STRIP LAYER SHALL BE SECURED IN PLACE WITH MIN NO. 18 GAUGE GALV STEEL TIE WIRE. IN WALL ASSEMBLIES, THE WRAP STRIP LAYER IS TO BE INSTALLED ON THE INSULATED PIPE IN THE SAME MANNER USED FOR FLOOR ASSEMBLIES BUT SHALL BE INSTALLED SYMMETRICALLY ON BOTH SIDES OF THE WALL.
3M COMPANY - TYPE FS-195+

5. PACKING MATERIAL - MIN 1 IN. THICK MINERAL WOOL BATT INSULATION FIRMLY PACKED INTO OPENING WITH ITS TOP SURFACE RECESSED MIN 1 IN. FROM TOP SURFACE OF THE FLOOR. IN WALL ASSEMBLIES, PACKING MATERIAL TO BE FIRMLY PACKED INTO OPENING ON BOTH SIDES OF WALL AND RECESSED MIN 1 IN. FROM WALL SURFACE. WHEN A SINGLE INSULATED PIPE (WITH WRAP STRIP LAYER) IS INSTALLED IN A CIRCULAR THROUGH OPENING AND WHEN THE MAX ANNULAR SPACE BETWEEN THE WRAP STRIP LAYER AND THE SIDES OF THE THROUGH OPENING IS 1/8 IN., NO FORMING MATERIAL IS REQUIRED.

6. FILL, VOID OR CAVITY MATERIALS* - CAULK OR SEALANT - APPLIED TO FILL THROUGH OPENING TO A MIN DEPTH OF 1 IN. IN FLOOR ASSEMBLIES, FILL MATERIAL TO BE INSTALLED FLUSH WITH TOP SURFACE OF FLOOR. IN WALL ASSEMBLIES, FILL MATERIAL TO BE INSTALLED FLUSH WITH WALL SURFACE ON BOTH SIDES OF WALL.
3M COMPANY - CP 25WB+ OR FB-3000 WT.

(NOTE - W RATING APPLIES ONLY WHEN FB-3000 WT IS USED.)
*BEARING THE UL CLASSIFICATION MARK
LAST UPDATED ON 2004-08-23

UL LISTED AND CLASSIFIED PRODUCTS UL RECOGNIZED COMPONENTSPRODUCTS CERTIFIED FOR CANADA

THROUGH-PENETRATION FIRESTOP SYSTEMS
C-AJ-5017
No Scale
4

EDMONDS Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

YORK MAIN BUILDING - HVAC REPLACEMENT
701 N Main St,
Jamestown, TN 38556

ELECTRICAL - DETAILS

REVISIONS

NO	DESCRIPTION	DATE
	REVISED	02-11-20

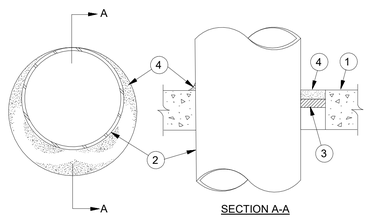
BNA19125

E3.11

DATE: 11-08-19

2/11/2020 5:05:22 PM

SYSTEM NO. C-AJ-1001
MARCH 05, 2007
F RATING - 3 HR
T RATING - 0 HR
W RATING - CLASS 1 (SEE ITEM 4)



SECTION A-A

1. FLOOR OR WALL ASSEMBLY - MIN 4-1/2 IN. (114 MM) THICK LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400 KG/M3) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF CIRCULAR THROUGH OPENING IS 32-1/2 IN. (826 MM).

SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

1A. STEEL SLEEVE - (OPTIONAL, NOT SHOWN) - NOM 12 IN. (305 MM) DIAM (OR SMALLER) SCHEDULE 40 (OR HEAVIER) STEEL PIPE SLEEVE CAST INTO CONCRETE FLOOR OR WALL. SLEEVE TO BE FLUSH WITH OR PROJECT MAX 2 IN. (51 MM) FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL.

2. THROUGH - PENETRANT - ONE METALLIC PIPE, CONDUIT OR TUBING INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE, CONDUIT OR TUBING AND PERIPHERY OF OPENING SHALL BE MIN OF 0 IN. (0 MM, POINT CONTACT) TO MAX 1-3/8 IN. (35 MM). PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:

A. STEEL PIPE - NOM 30 IN. (762 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

A1. IRON PIPE - NOM 30 IN. (762 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.

B. CONDUIT - NOM 6 IN. (152 MM) DIAM (OR SMALLER) RIGID STEEL CONDUIT.

C. CONDUIT - NOM 4 IN. (152 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING.

3. PACKING MATERIAL - POLYETHYLENE BACKER ROD OR NOM 1 IN. (25 MM) THICKNESS OF TIGHTLY-PACKED CERAMIC (ALUMINA SILICA) FIBER BLANKET, MINERAL WOOL BATT OR GLASS FIBER INSULATION MATERIAL USED AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF SOLID CONCRETE OR CONCRETE BLOCK WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF CAULK FILL MATERIAL (ITEM 4). AS AN ALTERNATE WHEN MAX PIPE SIZE IS 10 IN. (254 MM) DIAM AND WHEN MAX ANNULAR SPACE IS 1 IN. (25 MM), A MIN 1 IN. (25 MM) THICKNESS OF TIGHTLY-PACKED CERAMIC FIBER BLANKET OR MINERAL WOOL BATT PACKING MATERIAL MAY BE RECESSED MIN 1/2 IN. (13 MM) FROM BOTTOM SURFACE OF FLOOR OR FROM EITHER SIDE OF SOLID CONCRETE WALL.

4. FILL, VOID OR CAVITY MATERIALS* - CAULK - APPLIED TO FILL THE ANNULAR SPACE TO THE MIN THICKNESS SHOWN IN THE FOLLOWING TABLE:

Maximum Pipe Diameter Inches	Maximum Annular Space Inches	Packing Material Type (a)	Minimum Caulk Thickness Inches
10 (254)	1 (25)	BR, CF, GF or MW	1/2 (13) (B)
10 (254)	1 (25)	CF or MW	1/2 (13) (C)
30 (762)	2 1/2 (64)	BR, CF, GF or MW	1 (25) (B)

(A) BR=POLYETHYLENE BACKER ROD.
CF=CERAMIC FIBER BLANKET.
GF=GLASS FIBER INSULATION.
MW=MINERAL-WOOL BATT.
(B) CAULK INSTALLED FLUSH WITH TOP SURFACE OF FLOOR OR BOTH SURFACES OF WALL
(C) CAULK INSTALLED FLUSH WITH BOTTOM SURFACE OF FLOOR OR ONE SURFACE OF SOLID (NON-CONCRETE BLOCK) WALL

3M COMPANY - TYPE CP 25WB+ OR FB-3000 WT

(NOTE - W RATING APPLIES ONLY WHEN FB-3000 WT IS USED.)

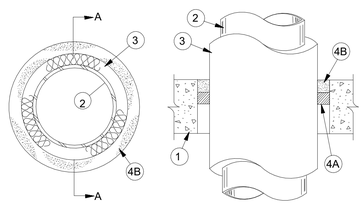
*BEARING THE UL CLASSIFICATION MARK LAST UPDATED ON 2007-03-05

UL LISTED AND CLASSIFIED PRODUCTS UL RECOGNIZED COMPONENTS PRODUCTS CERTIFIED FOR CANADA

THROUGH-PENETRATION FIRESTOP SYSTEMS
C-AJ-1001
No Scale

5

SYSTEM NO. C-AJ-5001
MARCH 05, 2007
F RATINGS - 1 1/2 , 2 AND 3 HR (SEE ITEM 4)
T RATINGS - 0, 1/2 , 3/4 AND 1 HR (SEE ITEMS 1A AND 4)
L RATING AT AMBIENT - 2 CFM PER SQ FT
L RATING AT 400 F - LESS THAN 1 CFM PER SQ FT



SECTION A-A

1. FLOOR OR WALL ASSEMBLY - MIN 2-1/2 IN. (64 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400 KG/.M3) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 18 IN. (457 MM)
SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

1A. STEEL SLEEVE - (OPTIONAL, NOT SHOWN) - NOM 10 IN. (254 MM) (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL SLEEVE CAST OR GROUTED INTO FLOOR OR WALL ASSEMBLY. SLEEVE MAY EXTEND A MAX OF 2 IN. (51 MM) ABOVE TOP OF FLOOR OR BEYOND EITHER SURFACE OF WALL. T RATING IS 0 HR WHEN SLEEVE IS USED.

2. THROUGH PENETRANT - NOM 4 IN. (102 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER PIPE, NOM 12 IN. (305 MM) DIAM (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 12 IN. (305 MM) DIAM (OR SMALLER) CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE OR NOM 12 IN. (305 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE CENTERED IN THE OPENING AND RIGIDLY SUPPORTED ON BOTH SIDES OF THE FLOOR OR WALL ASSEMBLY.

3. PIPE COVERING* - NOM 1/2 TO 2 IN. (13 TO 51 MM) THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN. 3.5 PCF OR 56 KG/M3) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY-APPLIED SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL FASTENERS OR WITH BUTT STRIP TAPE SUPPLIED WITH THE PRODUCT.
SEE PIPE AND EQUIPMENT COVERING - MATERIALS* (BRGU) CATEGORY IN BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

4. FIRESTOP SYSTEM - THE DETAILS OF THE FIRESTOP SYSTEM SHALL BE AS FOLLOWS:

A. PACKING MATERIAL - MIN 1 IN. (25 MM) THICKNESS OF FIRMLY PACKED MINERAL WOOL BATT INSULATION USED AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR SLEEVE OR FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF CAULK FILL MATERIAL (ITEM B).

B. FILL, VOID OR CAVITY MATERIAL* - CAULK OR SEALANT - APPLIED TO FILL THE ANNULAR SPACE FLUSH WITH THE TOP SURFACE OF THE FLOOR OR SLEEVE OR FLUSH WITH BOTH SURFACES OF WALL. WHEN NOM PIPE COVERING THICKNESS IS 2 IN. (51 MM), MIN THICKNESS OF CAULK FILL MATERIAL IS 2 IN. (51 MM). WHEN NOM PIPE COVERING THICKNESS IS 1-1/2 IN. (38 MM) OR LESS, MIN THICKNESS OF CAULK FILL MATERIAL IS 1 IN. (25 MM). THE HOURLY F AND T RATINGS OF THE FIRESTOP SYSTEM ARE DEPENDENT UPON THE THICKNESS OF THE FLOOR OR WALL, THE SIZE OF PIPE, THE THICKNESS OF PIPE COVERING MATERIAL AND THE SIZE OF THE ANNULAR SPACE (BETWEEN THE PIPE COVERING MATERIAL AND THE EDGE OF THE CIRCULAR THROUGH OPENING), AS SHOWN IN THE FOLLOWING TABLE:

Minimum Floor or Wall Thickness In.	Maximum Pipe Diameter Inches	Nominal Pipe Covering Thkns In.	Annular Space Inches	F Rating Hour	T Rating Hour
2-1/2 (64)	4 (102)	1 or 1 1/2(25 or 38)	1/2 to 2 3/8 (13 to 60)	2	1
4-1/2 (114)	4 (102)	2 (51)	1/4 to 3 5/8 (6 to 92)	2	1/2
2-1/2 (64)	12 (305)	1 (25)	1/2 to 1 1/2(13 to 38)	2	1/2
4-1/2 (114)	12 (305)	1 (25)	1/2 to 2 3/8 (13 to 60)	3	1
2-1/2 (64)	12 (305)	1/2 (13)	1/2 to 2 3/8 (13 to 60)	2	0

3M COMPANY - CP 25WB+ OR FB-3000 WT

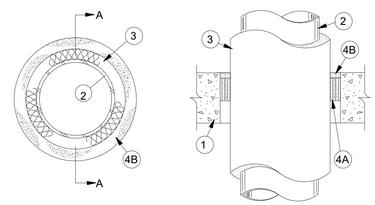
*BEARING THE UL CLASSIFICATION MARK LAST UPDATED ON 2007-03-05

UL LISTED AND CLASSIFIED PRODUCTS UL RECOGNIZED COMPONENTS PRODUCTS CERTIFIED FOR CANADA

THROUGH-PENETRATION FIRESTOP SYSTEMS
C-AJ-5001
No Scale

6

SYSTEM NO. C-AJ-5002
SEPTEMBER 03, 2004
(FORMERLY SYSTEM NO. 91-B)
F RATINGS - 2 AND 3 HR (SEE ITEMS 1A AND 4)
T RATINGS - 0, 1/2 AND 1 HR (SEE ITEMS 1A AND 4)
L RATING AT AMBIENT - 2 CFM/SQ FT
L RATING AT 400 F - LESS THAN 1 CFM/SQ FT



SECTION A-A

1. FLOOR OR WALL ASSEMBLY - MIN 2-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 36 IN.
SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

1A. STEEL SLEEVE - (OPTIONAL, NOT SHOWN) - NOM 36 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE SLEEVE CAST INTO MIN 4-1/2 IN. THICK CONCRETE FLOOR OR WALL. SLEEVE TO BE FLUSH WITH OR PROJECT MAX 2 IN. FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL. WHEN STEEL SLEEVE IS USED, F RATING IS 2 HR AND T RATING IS 0 HR.

2. PIPE - NOM 4 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER PIPE, NOM 15 IN. DIAM (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 30 IN. DIAM (OR SMALLER) CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE OR NOM 30 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE CENTERED IN THE OPENING AND RIGIDLY SUPPORTED ON BOTH SIDES OF THE FLOOR OR WALL ASSEMBLY.

3. PIPE COVERING* - NOM 1, 2 OR 3 IN. THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN. 3.5 PCF) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY-APPLIED SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL FASTENERS OR WITH BUTT STRIP TAPE SUPPLIED WITH THE PRODUCT.

SEE PIPE AND EQUIPMENT COVERING - MATERIALS* (BRGU) CATEGORY IN BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

4. FIRESTOP SYSTEM - THE DETAILS OF THE FIRESTOP SYSTEM SHALL BE AS FOLLOWS:

A. FILL, VOID OR CAVITY MATERIALS* - WRAP STRIP - NOM 1/4 IN. THICK INTUMESCENT ELASTOMERIC MATERIAL FACED ON ONE SIDE WITH ALUMINUM FOIL, SUPPLIED IN 2 IN. WIDE BY 24 IN. LONG STRIPS. NOM 2 IN. WIDE STRIPS TIGHTLY-WRAPPED AROUND PIPE COVERING (FOIL SIDE EXPOSED) TO FILL ANNULAR SPACE. EACH LAYER OF WRAP STRIP IS TO BE INSTALLED WITH A BUTTED SEAM, WITH THE BUTTED SEAMS IN SUCCESSIVE LAYERS STAGGERED. WRAP STRIP LAYERS SECURELY BOUND WITH STEEL WIRE OR ALUMINUM FOIL TAPE AND SLIDE INTO ANNULAR SPACE SUCH THAT THE TOP EDGES ARE RECESSED MIN 1/2 IN. FORM TOP SURFACE OF FLOOR. IN WALL ASSEMBLIES, THE WRAP STRIP LAYERS SHALL BE INSTALLED IN THE SAME MANNER USED FOR FLOOR ASSEMBLIES BUT SHALL BE INSTALLED SYMMETRICALLY ON BOTH SIDES OF THE WALL. THE MIN NUMBER OF WRAP STRIP LAYERS REQUIRED IS DEPENDENT UPON THE MAX PIPE SIZE AND THE PIPE COVERING THICKNESS, AS SHOWN IN THE FOLLOWING TABLE:

Minimum Floor or Wall Thickness In.	Maximum Pipe Diameter Inches	Nominal Pipe Covering Thkns In.	Annular Space Inches	Min No. of Wrap Strip Layers	F Rating Hour	T Rating Hour
2-1/2	6	1	1/4 to 3/8	1	2	1
2-1/2	6	2	1/2 to 5/8	2	2	1
2-1/2	12	1	1/4 to 3/8	1	2	1/2
4-1/2	12	1	1/4 to 3/8	1	2	1
4-1/2	12	2	1/2 to 5/8	2	2	1
4-1/2	20	1	1/2 to 1	2	3	1
4-1/2	30	2	3/4 to 1 1/4	3	2	1
4-1/2	20	3	1 to 1 1/2	4	2	1

3M COMPANY - FS-195+

B. FILL, VOID OR CAVITY MATERIALS* - CAULK OR SEALANT - APPLIED TO FILL THE ANNULAR SPACE (OVER EDGES OF WRAP STRIP LAYERS) TO A MIN DEPTH OF 1/2 IN., FLUSH WITH TOP SURFACE OF FLOOR OR BOTH SURFACES OF WALL.

3M COMPANY - CP 25WB+ OR FB-3000 WT

*BEARING THE UL CLASSIFICATION MARK LAST UPDATED ON 2004-09-03

UL LISTED AND CLASSIFIED PRODUCTS UL RECOGNIZED COMPONENTS PRODUCTS CERTIFIED FOR CANADA

THROUGH-PENETRATION FIRESTOP SYSTEMS
C-AJ-5002
No Scale

7

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EDMONDS
Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

YORK MAIN BUILDING - HVAC REPLACEMENT
701 N Main St,
Jamestown, TN 38556

ELECTRICAL - DETAILS

REVISIONS

NO	DESCRIPTION	DATE
	REVISED	02-11-20

BNA19125

E3.12

DATE: 11-08-19

1. REFERENCE

1.A.GENERAL CONTRACT PROVISIONS APPLY TO THE WORK OF THIS SECTION.
1.B.CODE: COMPLY WITH THE REQUIREMENTS OF THE GOVERNING BUILDING CODE, AND AUTHORITIES HAVING JURISDICTION.
1.C.PROVIDE ALL NECESSARY PERMITS AND APPROVALS AND PAYING ALL REQUIRED FEES IN CONNECTION WITH THE WORK OF THIS CONTRACT.
1.D.SUBMITTALS: WITH MANUFACTURER'S STANDARD DATA, INSTALLATION INSTRUCTIONS AND SPECIFICATIONS, SUBMIT SAMPLES FOR EACH ITEM AS REQUIRED.
1.E.ALL ELECTRICAL MATERIALS AND APPLIANCES SHALL HAVE THE LISTING OF THE UNDERWRITER'S LABORATORIES, INC., AND TYPES APPROVED BY LOCAL AUTHORITIES HAVING JURISDICTION.

2. WORK INCLUDED

2.A.THESE SPECIFICATIONS AND ACCOMPANYING DRAWINGS ARE INTENDED TO SECURE THE PROVISIONS OF ALL MATERIAL AND LABOR NECESSARY FOR THE COMPLETE INSTALLATIONS, TESTED AND READY FOR SERVICE, TOGETHER WITH COMPLETE ELECTRICAL WORK AS CALLED FOR HEREIN AND AS INDICATED ON THE DRAWINGS. WHEN CONFLICTS OCCUR IN THE SPECIFICATIONS OR ON THE DRAWINGS, OR BETWEEN EITHER, THE ITEMS OF GREATER QUANTITY OR HIGHER COST SHALL BE PROVIDED.
2.B.COMPLETE WIRING SYSTEMS FOR LIGHTING AND POWER INSTALLATION, HVAC, PLUMBING AND SPRINKLER SYSTEMS AND MISCELLANEOUS DEVICES.
2.C.A GENERAL DESCRIPTION OF THE ELECTRICAL WORK IS AS FOLLOWS:
2.C.A. ELECTRICAL SERVICE INSTALLATION.
2.C.B. BRANCH CIRCUIT WIRING, SWITCHES, RECEPTACLES, TELEPHONE AND SIGNAL OUTLETS.
2.C.C. LIGHTING FIXTURES AND LAMPS.
2.C.D. POWER WIRING TO MECHANICAL EQUIPMENT.
2.C.E. CUTTING AND ROUGH PATCHING
2.C.F. FURNISHING AND SETTING OF ALL SLEEVES THROUGH FLOORS, WALLS, WHERE REQUIRED, INCLUDING WATERPROOF AND FIREPROOF SEALING.
2.C.G. CORE DRILLING ASSOCIATED WITH THE ELECTRICAL WORK
2.C.H. TESTS AND INSPECTIONS OF ALL SYSTEMS UNDER THIS SECTION.
2.C.I. TEMPORARY LIGHT AND POWER FOR CONSTRUCTION PURPOSES.
2.C.J. PAYING ALL FEES AND PERFORMING ALL TESTING AND ADJUSTING, AND FURNISHING ALL CERTIFICATES OF APPROVAL.
2.C.K. RELOCATION AND/OR REMOVAL OF EXISTING ELECTRICAL WORK IN ACCORDANCE WITH DEMOLITION SCHEME, OR AS DIRECTED AND REQUIRED RESTORATION OF ELECTRICAL SERVICE IN AFFECTED ADJOINING AREAS WHICH ARE TO CONTINUE TO FUNCTION.
2.C.L. POWER DISTRIBUTION SYSTEM
2.C.M. SAFETY DISCONNECT SWITCHES WHERE REQUIRED, UNLESS FURNISHED WITH STARTERS OR ON EQUIPMENT.
2.C.N. GROUNDING AS REQUIRED BY CODE.
2.C.O. IDENTIFICATION OF EQUIPMENT.
2.C.P. PRIME PAINTING ELECTRICAL EQUIPMENT AND INSTALLATION COMPONENTS.
2.C.Q. FIRE ALARM, SMOKE DETECTION AND SPRINKLER ALARM SYSTEMS.
2.C.R. CABLE SUPPORT AND PULLBOXES.
2.C.S. INSTALLATION AND WIRING OF STARTERS AND CONTROLLERS. ALL REQUIRED CONDUIT AND WIRING FOR AUTOMATIC TEMPERATURE, SAFETY AND INTERLOCKING CONTROLS PERTAINING TO HVAC, PLUMBING, FIRE PROTECTION OR ELECTRICAL SYSTEMS AS CALLED FOR ON DRAWINGS AND SPECIFICATIONS.
2.C.T. INSTALLATION OF EQUIPMENT FURNISHED BY OTHERS.
2.C.U. HANGERS, ANCHORS, INSERTS, SUPPORTS, SLEEVES, CHASES.
2.C.V. RIGGING, SCAFFOLDING AND HANDLING OF ALL MATERIALS AND EQUIPMENT.
2.C.W. AS-BUILT DRAWINGS.

3. RELATED WORK SPECIFIED IN OTHER SECTIONS

3.A.THE FOLLOWING WORK, RELATED TO THIS SECTION, WILL BE FURNISHED AND/OR PERFORMED UNDER OTHER SECTIONS OF THE SPECIFICATIONS, OR BY OTHERS, AND SHALL NOT BE CONSIDERED AS PART OF THE WORK OF THIS SECTION:
3.A.A. FURNISHING MOTOR STARTERS AND ALL CONTROL DEVICES FOR MOTORS AND EQUIPMENT SPECIFIED UNDER OTHER CONTRACTS.
3.A.B. OPENINGS FOR SLEEVES IN WALLS AND FLOOR SLABS.
3.A.C. FINISH PAINTING.
3.A.D. FINISH PAINTING OF EXPOSED CONDUITS, BOXES, HANGERS, APPARATUS, ETC.
3.A.E. TEMPERATURE AND MOTOR CONTROL WIRING, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

4. SUBMITTALS

4.1. SUBMIT SHOP DRAWINGS COMPLETE IN EVERY DETAIL COVERING THE FOLLOWING ITEMS AS DESCRIBED IN THE CONTRACT DOCUMENTS OR AS MAY BE REQUIRED BY THE ARCHITECT:
4.1.A.A. FIRE ALARM SYSTEM
4.1.B. AFTER FINAL TESTS AND ADJUSTMENTS, FULLY INSTRUCT OWNER'S PERSONNEL IN ALL DETAILS OF OPERATION FOR EQUIPMENT INSTALLED. PROVIDE MULTIPLE COPIES OF OPERATION AND MAINTENANCE MANUALS PER SYSTEM AS REQUIRED.

5. EXAMINATION OF EXISTING CONDITIONS OF PREMISES

5.A.BEFORE SUBMITTING THE BID, THIS CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS AFFECTING THE WORK. NO EXTRA PAYMENTS WILL BE ALLOWED ON ACCOUNT OF EXTRA WORK MADE NECESSARY BY FAILURE TO DO SO.
5.B.EXAMINE ALL WORK PREPARED BY OTHERS TO RECEIVE THE WORK OF THIS SECTION AND REPORT ANY DEFECTS AFFECTING INSTALLATION TO THE GENERAL CONTRACTOR FOR CORRECTION. COMMENCEMENT OF WORK WILL BE CONSTRUED AS COMPLETE ACCEPTANCE OF PREPARATORY WORK BY OTHERS.
5.C.PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. SUBMIT FOR APPROVAL, DATE SCHEDULE OF NECESSARY TEMPORARY SHUTDOWNS OF EXISTING SERVICES. MAKE THESE WITHOUT ADDITIONAL CHARGE AT SUCH TIME AS WILL NOT INTERFERE WITH REGULAR OPERATION OF EXISTING FACILITIES AND ONLY AFTER WRITTEN APPROVAL OF OWNER. TO INSURE CONTINUOUS OPERATION, MAKE NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK WHEN SO REQUIRED.
5.D.CONTRACTOR SHALL TEST ALL EXISTING BRANCH CIRCUITS IN EXISTING PANELBOARDS PRIOR TO RE-USING SAID BRANCH CIRCUITS FOR THIS PROJECT. TESTING SHALL BE DONE DURING PREMIUM TIME, UNLESS APPROVED BY BUILDING OWNER AND EXISTING TENANTS.

6. COORDINATION OF WORK WITH OTHER TRADES

6.A.THE WORK OF THIS SECTION SHALL BE COORDINATED WITH THE WORK OF ALL OTHER CONTRACTS, THE UTILITY COMPANY, AND OF THE TELECOMMUNICATIONS COMPANY, AND SHALL BE SO ARRANGED THAT THERE WILL BE NO DELAY IN THE PROPER INSTALLATION AND COMPLETION OF ANY PART OR PARTS OF EACH RESPECTIVE WORK WHEREIN IT MAY BE INTERRELATED WITH THAT OF THIS CONTRACT SO THAT GENERALLY ALL CONSTRUCTION WORK CAN PROCEED IN ITS NATURAL SEQUENCE WITHOUT UNNECESSARY DELAY.

7. MATERIAL AND WORKMANSHIP

7.A.ALL MATERIAL SHALL BE NEW AND OF THE BEST QUALITY AND SHALL HAVE THE APPROVED UNDERWRITER'S LABEL ATTACHED. THE LABEL OF APPROVAL SHALL BE OF THE TYPE FOR THE INTENDED APPLICATION. THE WORK THROUGHOUT SHALL BE EXECUTED IN THE BEST AND MOST THOROUGH MANNER UNDER THE DIRECTION OF, AND TO THE SATISFACTION OF, THE OWNER WHO WILL INTERPRET THE MEANINGS OF THE DRAWINGS AND SPECIFICATIONS, AND THE OWNER SHALL HAVE THE POWER TO REJECT ANY WORK AND MATERIALS WHICH, IN THEIR OPINION, IS NOT IN FULL CONFORMANCE THEREWITH.
7.B.IF, AFTER INSTALLATION, OPERATION OF THE EQUIPMENT PROVES TO BE UNSATISFACTORY TO THE OWNER BY REASONS OF DEFECTS, ERRORS OR OMISSIONS, THE OWNER RESERVES THE RIGHT TO OPERATE THE EQUIPMENT UNTIL IT CAN BE REMOVED FROM SERVICE FOR CORRECTION BY THE CONTRACTOR. THE CONTRACTOR SHALL PAY FOR ALL DAMAGES TO WORK OF OTHER TRADES CAUSED BY THIS DEFECTIVE EQUIPMENT AND ITS REPLACEMENT.

8. INSPECTION AND TESTS

8.A.AT THE TIME OF THE FINAL INSPECTION AND TESTS, ALL CONNECTIONS AT PANELS AND ALL SPLICES, ETC., MUST BE MADE. ALL FUSES MUST BE IN PLACE AND THE CIRCUITS CONTINUOUS FROM SERVICE SWITCHES TO ALL PANELS, RECEPTACLES, OUTLETS, MOTORS, ETC. EACH ENTIRE WIRING SYSTEM MUST TEST FREE FROM ALL SHORT CIRCUITS AND FROM GROUNDS AS REQUIRED BY THE N.E.C..

9. RACEWAYS AND CONDUCTORS:

9.A.RACEWAY AND CONDUCTOR WORK SHALL CONSIST OF THE VARIOUS TYPES OF CONDUITS, SUPPORTS AND FITTINGS AS SPECIFIED AND REQUIRED FOR AN APPROVED INSTALLATION IN ACCORDANCE WITH THE FOLLOWING GUIDELINES:
9.A.A. TYPE EMT SHALL BE USED FOR ALL INDOOR CONDUIT AND TYPE PVC CONDUIT SHALL BE USED FOR ALL EXTERIOR AND UNDERGROUND CONDUIT, AS APPROVED BY AUTHORITY HAVING JURISDICTION.
9.A.B. MECHANICALLY JOIN ALL METAL RACEWAYS, ENCLOSURES AND RACEWAYS FOR CONDUCTORS TO FORM A CONTINUOUS ELECTRICAL CONDUCTOR. CONNECT ALL ELECTRICAL BOXES, FITTINGS AND CABINETS SO AS TO PROVIDE AN EFFECTIVE ELECTRICAL CONTINUITY AND A FIRM MECHANICAL ASSEMBLY.
9.A.C. INSTALL RACEWAYS SO THAT REQUIRED CONDUCTORS MAY BE DRAWN IN WITHOUT INJURY OR EXCESSIVE STRAIN TO THE RACEWAY OR CABLE.
9.A.D. DO NOT CROSS PIPE SHAFTS OR VENT DUCT OPENINGS WITH RACEWAYS. ROUTE RACEWAYS TO AVOID PRESENT OR FUTURE OPENINGS IN FLOORS, WALLS, OR CEILING CONSTRUCTION, WHEN SO INDICATED ON THE DRAWINGS.
9.A.E. INSTALL RACEWAYS TO AVOID PROXIMITY TO STEAM AND HOT WATER PIPES. KEEP RACEWAYS A MINIMUM OF 3" FROM SUCH PIPES.
9.A.F. KEEP ENDS OF RACEWAYS PLUGGED OR CAPPED DURING CONSTRUCTION.
9.A.G. PROVIDE EXPANSION - DEFLECTION FITTINGS IN ALL RACEWAYS PASSING THROUGH STRUCTURAL EXPANSION JOINTS.
9.A.H. FEEDERS TO PANELS SHALL BE IN CONDUIT.
9.B.BRANCH CIRCUIT/FEEDER WIRING SHALL BE AS FOLLOWS:
9.C. ALL BRANCH CIRCUIT WIRING SHALL BE INSULATED COPPER CONDUCTORS (MINIMUM #12 AWG). TYPE THHN-THWN and XHHW-2, XHHW-2.
9.D.ALUMINUM EQUIVALENT FEEDERS MAY BE USED FOR SIZES OVER #8 AWG.
9.E. TYPE MC CABLE MAY BE USED AS APPROVED AUTHORITY HAVING JURISDICTION,
9.F. DIRECT BURIAL CABLE: UF OR USE CABLE.

10. SAFETY SWITCHES

10.A. TYPE A, 250 VOLT, SINGLE THROW, FUSED OR UNFUSED IN APPROVED NEMA ENCLOSURE.
10.B. SWITCHES SHALL BE HORSEPOWER RATED, HEAVY DUTY, QUICK-MAKE, QUICK-BREAK.

11. MOLDED CASE CIRCUIT BREAKERS

11.A. SINGLE, 2 OR 3 POLE AS NOTED.
11.B. THERMAL - MAGNETIC TYPE.
11.C. AUTOMATIC TRIPPING: CLEARLY INDICATED BY HANDLE AUTOMATICALLY ASSUMING POSITION DISTINCTIVE FROM NORMAL "ON" AND "OFF" POSITIONS.
11.D. INVERSE TIME - LIMIT CHARACTERISTICS - TO PREVENT TRIPPING OR MOMENTARY OVERLOADS, BUT TRIP BEFORE DANGEROUS VALUES ARE REACHED.
11.E. INTERRUPTING CAPACITIES REFERRED TO ARE ASYMMETRICAL VALUES.
11.F. BOLTED TYPE CONSTRUCTION.
11.G. ENCLOSURE COMPENSATED.
11.H. "E" FRAME, SINGLE, 2 OR 3 POLE, 10,000 AMPERE INTERRUPTING CAPACITY AT 208 VOLTS UNLESS OTHERWISE NOTED.

12. WIRING DEVICES

12.A. SWITCHES SHALL BE HEAVY DUTY, TOGGLE, QUIET TYPE,FULLY ENCLOSED IN COMPOSITION CASES. SWITCHES SHALL BE RATED 20 AMP, 120/277 VOLTS, AC. STYLE AND FINISH TO BE DETERMINED BY ARCHITECT. WHERE MORE THAN ONE SWITCH IS BEING INSTALLED, PROVIDE MULTIPLE GANG SWITCH PLATES FOR NUMBER OF SWITCHES AS REQUIRED.
12.B. RECEPTACLES SHALL BE THE GROUNDING TYPE, COMPOSITION BASE, MEETING NEMA STANDARDS. STYLE AND FINISH TO BE DETERMINED BY ARCHITECT. COORDINATE W/ARCH TYPE OF FACEPLATE
12.C. FACEPLATES FINISH AND STYLE TO BE DETERMINED BY ARCHITECT. PROVIDE MULTI-GANG PLATES WHEN MOUNTING DEVICES SIDE BY SIDE.
12.D. FLOOR BOXES SHALL BE HUBBELL B25 SERIES OR APPROVED EQUAL. COORDINATE FINAL FINISH WITH ARCHITECT.

13. COORDINATION

13.A. THIS CONTRACTOR SHALL COORDINATE HIS WORK WITH THAT OF THE CONTRACTOR FOR GENERAL CONSTRUCTION AND WITH THE CONTRACTORS FOR THE OTHER MECHANICAL TRADES.

14. POWER WIRING SYSTEM

14.A. GENERAL - PROVIDE WIRING FROM SWITCHES AND PANELBOARDS TO PANELBOARDS, LIGHTS, SWITCHES, RECEPTACLES, JUNCTION BOXES AND ALL OTHER CURRENT CONSUMING APPLIANCES OR CONTROL DEVICES.

15. REMOVAL OF EXISTING WORK

15.A. REMOVE AND/OR RELOCATE ALL ELECTRICAL EQUIPMENT, WIRING ANDOTHER ELECTRICAL WORK SO INDICATED OR REQUIRED BY REMOVAL OF OR CHANGES IN EXISTING CONSTRUCTION. DISCONNECT LOAD AND LINE ENDS OF CONDUCTORS FEEDING PANELBOARDS, CONTROLLERS, MOTORS, APPLIANCES, AND DEVICES WHICH ARE TO BE REMOVED OR ABANDONED. REMOVE CONDUCTORS FROM EXISTING CONDUITS THROUGH WHICH NEW CONDUCTORS ARE TO BE PULLED. CUT AND CAP FLUSH WITH FLOOR ALL ABANDONED CONDUITS. REMOVE ABANDONED SURFACE MOUNTED CONDUITS. REMOVE MATERIAL AND EQUIPMENT AND DISPOSE OF SAME AS DIRECTED. WHERE ANY FIXTURE OR WIRING DEVICE IS REMOVED, PROVIDE ADEQUATE SIZE AND TYPE OF BLANK COVER PLATE OVER EACH OUTLET.

16. SHUTDOWNS

16.A. WHEN INSTALLATION OF A NEW SYSTEM REQUIRES THE TEMPORARY SHUTDOWN OF AN EXISTING OPERATING SYSTEM, THE CONNECTION OF THE NEW SYSTEM SHALL BE PERFORMED AT SUCH TIME AS DESIGNATED BY THE OWNER.
16.B. THE OWNER SHALL BE NOTIFIED OF THE ESTIMATED DURATION OF THE SHUTDOWN PERIOD IN ADVANCE OF THE DATE THE WORK IS TO BE PERFORMED.
16.C. WORK SHALL BE ARRANGED FOR CONTINUOUS PERFORMANCE, INCLUDING OVERTIME, AT NO EXTRA COST TO THE OWNER TO ASSURE THAT EXISTING OPERATION SERVICES WILL BE SHUT DOWN ONLY DURING THE TIME ACTUALLY REQUIRED TO MAKE NECESSARY CONNECTIONS.

17. GENERAL

17.A. AT THE END OF EACH WORKING DAY, THIS CONTRACTOR SHALL DEPOSIT ALL DEBRIS PERTAINING TO HIS TRADE AT A SPOT ON EACH FLOOR, DESIGNATED BY THE GENERAL CONTRACTOR WHO WILL DISPOSE OF SAID DEBRIS.
17.B. PROVIDE A COMPETENT SUPERINTENDENT WHO SHALL BE IN CHARGE OF THE WORK TO BE INSTALLED UNDER THIS SECTION OF THE SPECIFICATIONS.

18. ADDRESSABLE, CODED FIRE ALARM, SMOKE AND SPRINKLER ALARM SYSTEM

18.A. THE ADDRESSABLE, CODED FIRE ALARM, SMOKE ALARM SYSTEM IS EXISTING AND INTERFACE SHALL CONSIST OF THE MINIMUM:
18.A.A. DUCT TYPE SMOKE DETECTORS.
18.A.B. FAN SHUTDOWN CONTROL RELAYS.
18.A.C. AIR HANDLING FAN SHUTDOWN CONTROL.
18.A.D. BATTERY STANDBY.
18.A.E. ALARM AT FACP.
18.A.F. TROUBLE AT FACP.
18.B. SYSTEM SHALL MEET NFPA72, LOCAL AND STATE BUILDING CODES, AND ALL OTHER AUTHORITIES HAVING JURISDICTION.
18.C. CIRCUITING GUIDELINES:
18.C.A. EACH ADDRESSABLE LOOP SHALL CONTAIN NO MORE THAN 80% DEVICE LOADING.
18.C.B. LOOP SHALL HAVE CLASS B OPERATION.
18.C.C. PROVIDE 1 ALARM CODE FOR EACH PULLSTATION.
18.C.D. PROVIDE 1 ALARM CODE FOR EACH DUCT DETECTOR.
18.C.E. PROVIDE SPRINKLER VALVE SUPERVISORY SWITCHES.
18.D. ADDRESSABLE DUCT SMOKE DETECTOR; ANALOG PHOTOELECTRIC TYPE. INTEGRAL MICROPROCESSOR. FORM C CONTACTS FOR FAN SHUTDOWN. PROVIDE SAMPLING TUBE FOR DUCT MOUNTING.

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EDMONDS Engineering
51 Century Boulevard, Suite 350
Nashville, TN 37214
P: (615) 265-8071
EDMONDSENGINEERING.COM

YORK MAIN BUILDING - HVAC REPLACEMENT
701 N Main St,
Jamestown, TN 38556

ELECTRICAL - SPECIFICATIONS

REVISIONS

NO	DESCRIPTION	DATE
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